Amateur Radio

January 1996
Volume 64 No 1

WIRELESS INSTITUTE OF AUSTRALIA

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including...

- VHF Antenna in a Lunchbox
- The Garran 40 m CW QRP Transmitter
- The Ground Plane Antenna

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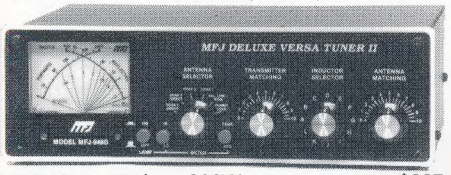

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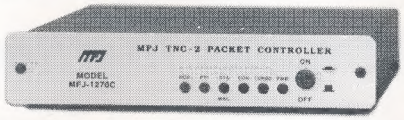

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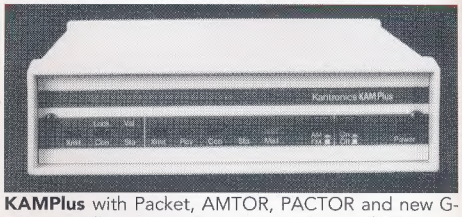

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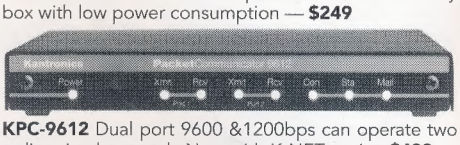

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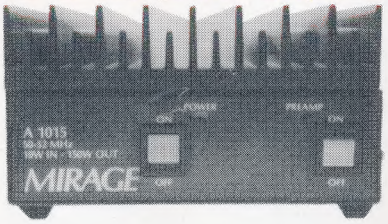

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Cover

In mid-1995, eight year old Ved Kamat became Australia's youngest radio amateur with the callsign VK2LAD. Ved's parents, Gopal VK2WGY and Sarvita, proudly write that at the age of six, when Ved was given an Electronics Hobby Kit, to their amazement he wired up all the hobby projects with most of them working the first time. During 1995 Ved was in year four at the International Grammar School where, amongst other subjects, he was adding to his fluency in Marathi (an Indian language) by studying Japanese and Italian. Apart from amateur radio, Ved's hobbies include reading, karate, swimming, computers, chess and the piano.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Let Me Clarify That!

There are two items this month which have something in common, namely that I made a statement to someone which they later found hard to believe. One item concerns delays in publication, and the other is entirely technical. Both need clarification.

To begin with publication problems. An author who had not contributed to *Amateur Radio* until about six months ago has taken me to task about the fact that his first article has yet to be published. It will be, very soon, but why has it taken six months or more?

The reason is simply that material does not come to us in a smooth flow of (say) three technical articles and five general interest articles a month. That is roughly the rate at which we publish them. But they come in, from all you industrious experts, experimenters or thinkers, in a series of feasts or famines!

Sometimes, as my colleague Graham Thornton was fond of saying, we are "scraping the bottom of the barrel", but only a few months later we face a mountain of material which can't all be published at once!

The situation is rather like a diode rectifier, fed with intermittent pulses, charging a large capacitor. If the pulses are close enough and/or the capacitor large enough, the output will be reasonably steady DC. We want a steady DC output of 56 pages per month even though no input pulses come in some months and then several big pulses come at once! To complicate things we have another circuit feeding in a steady input of about 30 columns per month!

I won't try to stretch the analogy further to cater for articles with dozens of diagrams to be re-drawn or others which need extensive re-writing for various reasons. The end result is that some things are published quickly and others are not. We have some items still to be published which came in as much as two years ago.

The other topic also involved Graham Thornton. Some months ago he quoted me on the topic of breakdown voltage in air-dielectric capacitors, to the effect that even with very small air-gaps there will be no breakdown for voltages up to about 500. I could not produce a reference at the time. Now Gary Bold ZL1AN (in November 1995 *Break-In*) queries the statement. Since it has now become "international", perhaps I'd better "put up or shut up"!

One reference I found was in a textbook "Principles of Electricity and Electro-Magnetism" by G P Harnwell, published in 1938. In a chapter entitled "Electrical Conduction in Gases" there is a diagram (attributed to W R Carr) which plots breakdown voltage Vb against Pd (the product of pressure and gap) for air, hydrogen and helium.

There are two interesting features of this diagram. Firstly, that the product Pd, not either parameter on its own, controls the breakdown voltage (between "large plane electrodes", so a variable capacitor fits the specification). This fact is named in the text as "Paschen's Law". Secondly, the breakdown voltage for air is a minimum at Pd = 0.5 (pressure being in mm of mercury and gap in cm). Thus, for atmospheric pressure (760 mm) this means a gap of about 0.006 mm (a very small gap, indeed!), yet this minimum breakdown voltage is seen

Continued on page 3

Editor's Comment

Continued from page 2

to be about 350 volts. Yes, I was wrong! Not 500 volts, but 350. It's still surprising, isn't it?

To achieve much higher breakdown voltages, the gap must be greatly increased or the pressure reduced (as in vacuum variable capacitors). Space precludes me from going further, but I hope both Graham and Gary are now happier and the rest of us are better informed!

Bill Rice VK3ABP
Editor
ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of November 95.

L10156	MR I LOWE
L21006	MR M R ROLL
L21007	MR W H WILMANSKI
VK2MGM	MRS M GAUSE
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WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts	1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Rob Apathy Len Jones Alex Colquitt	VK1KRA VK1NLJ VK1AC	3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) $70.00 (G) (S) $56.00 (X) $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours e-mail address: wainsw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) $66.75 (G) (S) $53.40 (X) $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH, VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) $60.75 (G) (S) $48.60 (X) $32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

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■ Antennas

VHF Antenna in a Lunchbox — The Magnetic Loop on Two Metres

Lloyd Butler VK5BR describes how to build an unusual 2 m antenna for limited space situations*

Introduction

From time to time we have written about the small transmitting loop antenna, sometimes called the magnetic loop because its radiation is generated only from its magnetic field (and not any electric field). Much of the more recent design information is based on work carried out by Ted Hart W5QJR. This has been published in *QST* and in recent editions of the *ARRL Antenna Handbook*.

The articles I have seen concentrated on antennas for the HF bands and didn't appear to make any specific reference to the VHF spectrum. I thought it might be interesting to make a loop for the 2 metre band and see how it would perform. In the following paragraphs I describe how a 2 metre loop was assembled and adjusted and discuss the performance achieved.

The Loop

In describing the loop, I will refer to imperial measurements as well as metric. The reason for this is that the design formulae I have used, as given by Ted Hart, are in imperial form. The loop is circular with a diameter of 5.25 inches (133 mm) and made with 0.25 inch (6.4 mm) copper tube. The ring formed is open at the top to connect a variable tuning capacitor which is set to resonate with the inductance formed by the loop. To enable variable tuning of the loop, natural resonance formed by the loop inductance with its self capacitance must be at a frequency higher than the operating frequency. For the dimensions used, the loop resonates around 144-148 MHz with just 4 pF and, if the loop was a little larger, it would self resonate without added capacity at a frequency lower than 144MHz.

The larger the loop, the higher the radiation resistance and the higher the efficiency. Hence it is desirable to make it as large as possible. However, to allow tuning adjustment, the loop is about as large as it can go.

The copper loop can be considered as a one turn inductor which, when excited, has a magnetic field. As the field is not confined, energy from the circuit is lost in the form of radiation and shows up as a resistance called radiation resistance in series with the loop at its centre. At this point we might refer to figure 1 and see that the centre is the point designated C.

Also in series with the radiation resistance is a loss resistance resulting from the RF resistance of the loop conductor and losses in the tuning capacitor. Radiation resistance is in the order of only a fraction of an ohm. To maintain high efficiency, the ratio of loss resistance to radiation resistance must be kept extremely low, hence the need for a conductor such as copper tube with low resistivity and a large surface area. In a larger loop made for the HF bands, I used 0.75 inch (19mm) copper tube but I thought that this was a bit cumbersome for the small 2 metre loop and settled for the 0.25 inch tube.

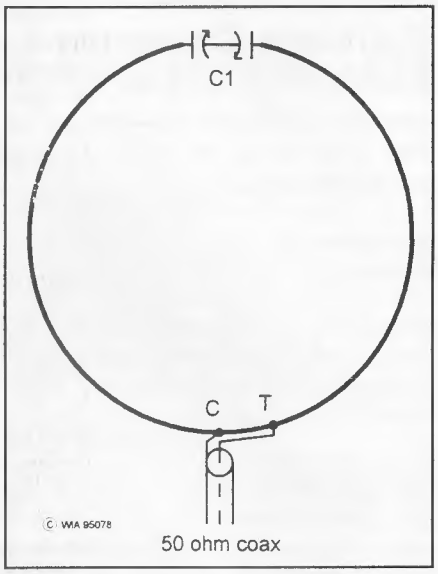

Figure 1 — Magnetic loop for two metres.
Loop diameter: 5.25 inches (133 mm).
Material: Copper tube 0.25 inch (6.4 mm).
C1: Butterfly capacitor with range across stators of 2 to 5 pF.
Matching tap: See text.

Another consideration is loss resistance in the wiper arms of the tuning capacitor. This is eliminated by connecting the loop across the two stator arms of a split stator capacitor so that the capacitance is the resultant value of the two halves in series. In this arrangement, the wiper arms float and are not in series with the tuned circuit. For this component, I used a small wide spaced nine plate butterfly capacitor which I measured to have a capacitance range of 2 to 5 pF across the stator plates and which nicely tuned around the 4 pF required. The wide spacing is also important as the loop operates at a very high Q and a high voltage is developed, even at quite low powers.

The constants for the loop have been calculated from formulae given in the material by Ted Hart:

Loop Inductance	0.24 μH
Distributed Capacity	1.1 pF
Tuning Capacity	3.9 pF
Radiation Resistance	0.35 ohm
Loss Resistance	0.06 ohm
Efficiency	85%
Loop Q	268
Potential across capacitor:	For 25 watts — 1200 V RMS For 100 watts — 2400 V RMS

If you are interested in the formulae used, they are published in the 15th edition of the *ARRL Antenna Handbook* (and possibly a later edition) and also reprinted with my article on these loops in *Amateur Radio,* November 1991.

Coupling

Assuming the loop is at resonance, a resistance can be seen between its centre C and a tap T part way up the loop. Its value is zero at the point C, increasing as it is moved up and becoming a very high value where it joins the capacitor. A point T is found where it reflects 50 ohms and at this point we couple in our 50 ohm feed line. Of course this is a classical gamma match which normally includes a series capacitor to correct for the inductive reactance of the length of lead from the coax line to the tap point.

For this application, I didn't think the capacitor was needed as a reactance correction would be reflected in resonating the whole thing as a unit. In practice I found that, provided the loop was properly resonated, the tap could be set to produce an SWR reading in the 50 ohm line of close to 1:1.

Assembly Detail

The general assembly of the loop and housing is shown in figures 2 and 3.

With such a high Q, tuning is very critical and some form of reduction drive, coupled to the variable capacitor, is essential to tune to resonance. I used a 6 to 1 vernier drive and, even with this reduction, adjustment is very critical and has to be finely set. With the capacitor used, the frequency range of 144 to 148 MHz is covered by seven degrees of shaft rotation.

To connect the butterfly capacitor, the copper tube was drilled to take the stator legs. These were solidly soldered in place with the aim of minimising loss resistance. The butterfly capacitor and its connection to the copper tube is shown in figure 4.

Two clamps made of copper strip were fitted for the matching connection. The one at the centre was soldered in place to ensure a low resistance connection. The other was made adjustable so that it could be moved along the copper tube to find the best position for low SWR. Once this was determined, the second clamp was also soldered in place. The 50 ohm feedline is connected via a BNC panel mounted connector. The outer part of the connector joins the centre clamp via a soldered lug. A stub wire is connected from the centre lug of the connector to tap T. Following tap adjustment, this ended up around 23 mm long and spaced out from the copper tube about 15 mm. A closer view of the coupling system is shown in figure 5.

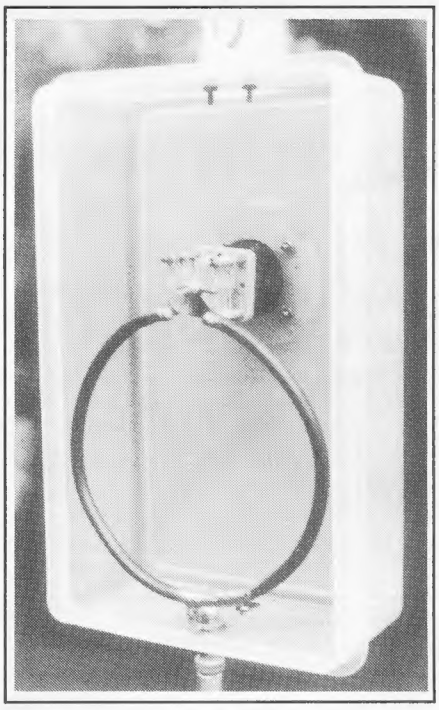

Figure 2 — The 2 Metre Antenna in a Lunch Box.

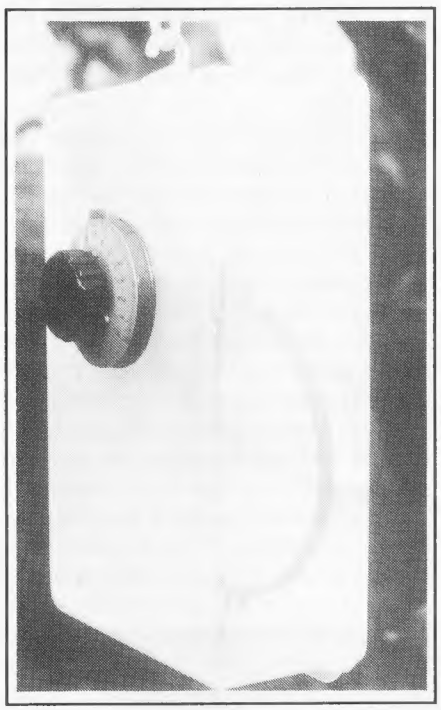

Figure 3 — The loop antenna — box cover removed.

I needed some sort of non metallic housing to mount the vernier dial and the coax connector and did a search of the local Big W and Target stores for a suitable box. I selected a nice polythene "lunch box" which measured 155 mm x 255 mm x 75 mm. As you can see from the photographs, the 255 mm dimension is quite a bit more than I needed but the other two dimensions suited me fine.

I liked the idea of the lunch box name for my antenna but the one selected is really more than that as it is suitable for microwave oven use. This is good because, if the material has low dielectric absorption at microwave frequencies, it will also have low absorption around the VHF antenna. The box idea is also useful for outside use as it can be sealed easily against the elements with a silicone sealer.

Components

Perhaps it is of interest to discuss the source of all the components used. The copper tube was left over from a household plumbing job. The butterfly capacitor was found in the spare capacitor box. A few of these often change hands at amateur radio trading marts and sometimes they fall into my hands. I think most of them were retrieved from early mobile TCA VHF transceivers such as the 1675 and 1677.

The nylon hook at the top of the box was found in my box of sailing boat spares. The vernier dial was given to me some 50 years ago by a gentleman who had taken it from a wartime Japanese transceiver he had dismantled. The BNC connector was one of a number retrieved some time ago from some discarded commercial gear. The box I have already told you about and this cost just under five dollars. To me, recycling whatever I can at minimal cost is much of what amateur radio is all about.

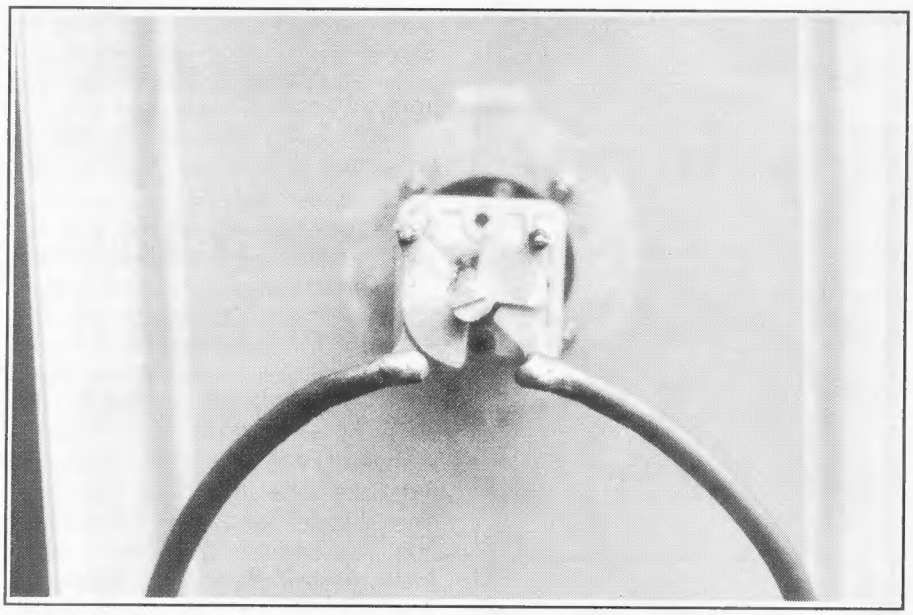

Figure 4 — C1, the butterfly capacitor and the conection to the loop.

Performance

The loop is mounted so that its plane is vertical and the antenna radiates a vertically polarised signal. The signal is bi-directional with lobes peaking in line with the plane of the loop. The lobes are fairly broad and the loop only needs to be oriented in the general direction required. However, fairly sharp nodes occur at right angles to the plane of the loop.

As indicated before, the tuning is very sharp and it can be put off tune by hand capacitance. To manually tune, one must be in visual distance of an SWR meter in the transmission line and the capacitance tuning dial is operated at arm's length to minimise body capacitance effects. Off tune, the SWR shows high — to resonate, carefully tune for a sharp dip in reflected power.

With the loop tuned properly to resonance and facing in the right direction, the results achieved seemed comparable with a J-Pole antenna used at the same height. On receiving, the two antennas gave comparable S meter readings.

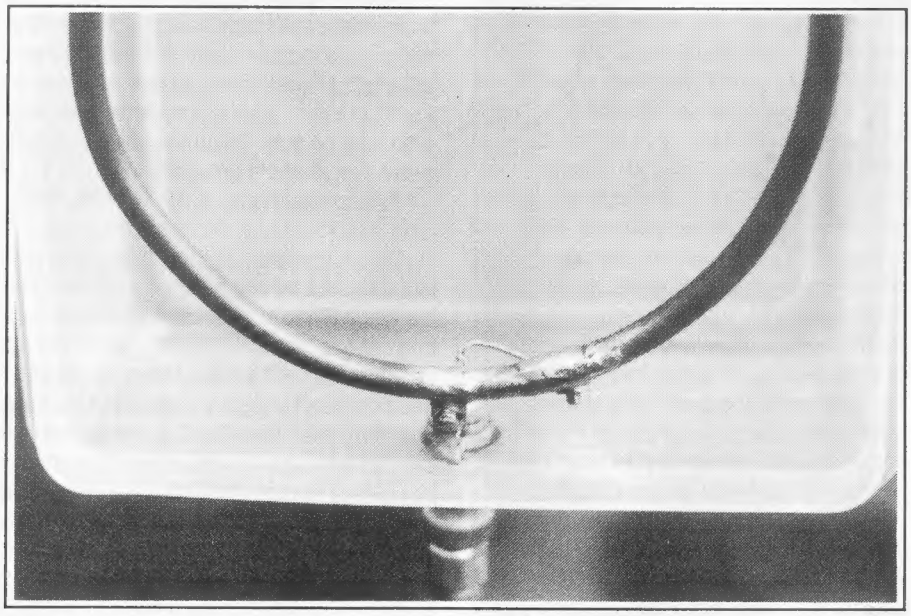

Figure 5 — The matching stub and BNC connector.

However, the problem with these loops is their narrow bandwidth. To maintain an SWR reading within 1.5:1, this one is limited to a band of little more than 100 kHz. To go beyond that, the butterfly capacitor must be retuned. There is no problem maintaining an SWR close to 1:1 over the whole 144 to 148 MHz but the capacitor must be reset for the particular limited section of the band used.

I had no problem working local repeaters with this antenna and I had adequate received signal fed to the transceiver. However, if the loop is tuned up nicely on the transmit frequency to trigger the repeater, it is way off tune on the receive frequency 600 kHz away and hence the receive signal is attenuated. This could be a problem where the signal from the repeater is of marginal strength.

Conclusions

The two metre magnetic loop is a compact antenna which can easily be hung up under the eaves, the carport, or any other place where space is limited including indoors. It is probably best suited to a situation where a dedicated transceiver operates on a fixed frequency such as a single packet channel. Properly tuned up for the single frequency and directed towards the other station, it appears to work as well as a full size vertical dipole.

However, in its static form it has a narrow bandwidth and has to be tuned to track across the band. This makes it less suitable to cover a general range of channels across the band and, to achieve this, remote motor tuning would need to be considered. It would seem to me that if this extra complication was the option, it would be far simpler to find space to fit in a J-Pole or other wider bandwidth antenna.

References

1. *The ARRL Antenna Handbook, 15th Edition, Chapter 5, Loop Antennas.*
2. *Lloyd Butler VK5BR — Some Experiments with the Small Transmitting Loop Aerial — Amateur Radio, November 1991.*

**18 Ottawa Avenue, Panorama SA 5041*

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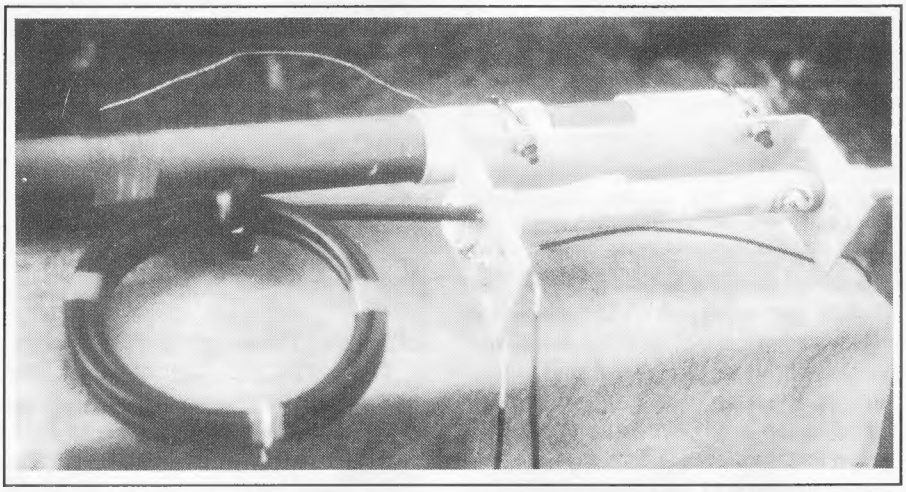
■ Antennas

The Ground Plane Antenna

Adrian Fell VK2DZF describes how to build an effective DX antenna.*



The feedpoint of the 20 m ground plane. The white PVC sections isolate the radials from the steel mast. The coil of coax is the RF choke.

A previous article written by the author, and published in *Amateur Radio,* discussed the differences between a quarter-wavelength-long vertical mounted on the ground and one raised into the air. Comparison tests were done between these two different designs. This article gives a more in-depth view of the Elevated Ground Plane.

In its simplest form all that is required to construct a ground plane (GP) is a length of aluminium (or wire) 0.25 of a wavelength long with two radial wires of the same length joined to the coaxial feeder braid at the feedpoint. It would not take very long to mount this to a length of timber and attach the whole device to a fence or even hang it in a tree.

This was very similar to the author's first GP and it worked quite well. If you give your GP a bit more commitment, better performance, and possibly less TVI, could be the result.

When the GP is located on or very close to the ground, then a lot of radial wires must be used if losses are to be kept low, as RF current will want to flow in the ground itself. This lowering of the antenna's efficiency will be especially noticed when lengths of 0.25 (or less) of a wavelength are used for the radiating element. The text books tell us at least forty radials must be used if the vertical is to have a high efficiency in these circumstances.

If the GP is moved up away from the ground, the effects of the ground become less until a point is reached when only three or four radials will be required for good efficiency. Three or four radials is quite common amateur practice at frequencies of 14 MHz and higher. The ground effect should not be ignored even at heights of 0.25 wavelength or higher. The experimenter may benefit by adding a few more radials.

At frequencies lower than 14 MHz it would take some good engineering and space to obtain the above mentioned height. The author knows of one or two amateur stations using a GP on 80 or 40 metres. A single linear or inductively loaded radial may be worth looking at if one is starting from scratch to build such a monster.

There can be a slight risk that the antenna will have some high angle lobes of radiation, adding to the low angle one already present, if the antenna is raised too high off the ground. Raising the antenna well off the ground may prove a great advantage in any case, as it will get the vertical section above surrounding objects such as houses, sheds or trees, etc.

If the radials are run out horizontally the feedpoint impedance can be expected to be around the 30 ohm mark, giving a VSWR of 1.66 to 1 at resonance. Although the bandwidth will be excellent the VSWR will be higher at the band edges. Most valve final stages will easily tolerate such readings along with most solid state transmitters, but these figures can easily be improved for those who prefer to see better readings. However, it does not mean that the

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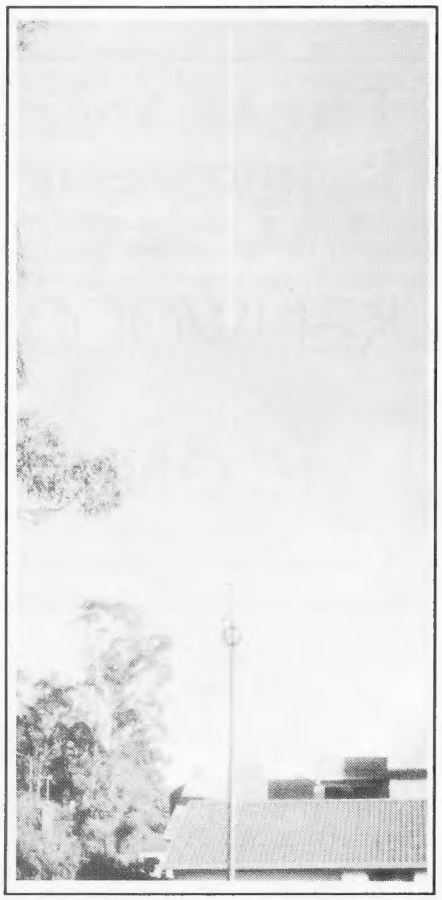
antenna will work any better, so don't get too carried away in the excitement to get a 1:1 VSWR.

One way to do this is to make the radiating element longer, up to about 0.28 of a wavelength, thereby raising the feedpoint impedance up to 50 ohms. This will introduce some reactance which will need to be tuned out by an additional series tuned capacitor. There are other methods as well, like using a variable inductance, but these methods are rarely used in amateur circles.

The easiest method to raise the feedpoint impedance up from 30 to 50 ohms is to droop all the radials down to an angle of approximately 40 to 45 degrees. This will result in an excellent impedance match between the GP feedpoint and the coaxial cable. This is the most widely used method with amateur radio applications.

Care should be taken not to drop the angle of the radials too low in an attempt to get a perfect 1 to 1 VSWR as there is always a risk that the antenna will act more like a vertical dipole than a GP and a higher angle of radiation could result. It has been claimed that drooping the radials down gives the antenna some slight signal gain because the radials start to add to the radiation pattern. For the antenna to have a true RF ground the radials should not radiate any RF and this may mean using a lot of them in the horizontal plane, even with the GP located up away from the ground. In practice it's a matter of trade-offs and, for peace of mind, the author would prefer to see a slightly higher VSWR than 1:1 indicating an impedance lower than 50 ohms. After all, we want a ground plane and not a vertical dipole.



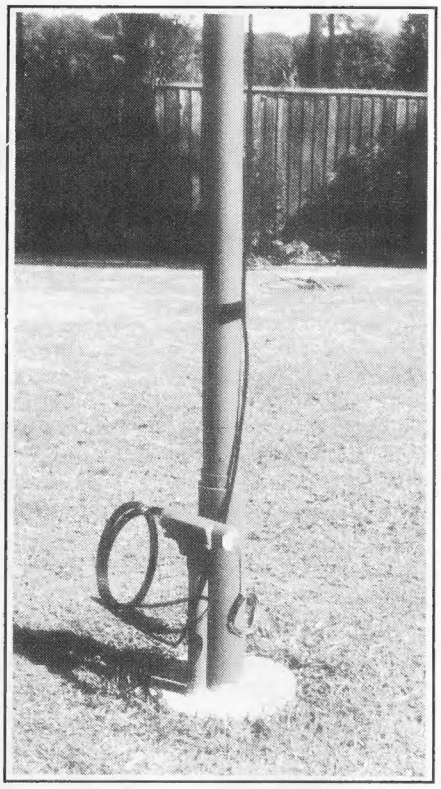
The 20 m ground plane in position. The feed point is 7 m above ground. One has to look hard to see the radials.

There will be some interaction between adjusting the angle for the best impedance match and tuning the radial lengths for resonance. The radials can be medium to heavy size solid, or stranded, copper wire and initially they should be cut to a length longer than required as they may need to be adjusted once the GP is up in the air. Black insulated wire is easy on the eye and helps keep the neighbours and XYL happy.

The overall electrical length of the GP is 0.5 of a wavelength, from the tip of the vertical to the tip of any one radial, and is fed at the centre. Care should be taken because physically identical lengths of aluminium, especially a tapered section, and wire may differ in electrical length.

A radial system for a GP at HF will more than likely use wire. The formula for a 0.25 wavelength of wire is 234/f in feet (f in MHz). This formula could also be used to obtain the approximate physical length of an aluminium radiator. In any case, proximity effects can affect such formulas.

From the author's experience a few factors can come into play. For example, using the same piece of aluminium vertical tubing, different lengths were required depending on its height above ground. With the antenna high in the air the tapering effect came into play. With the antenna at ground level the wire formula ended up being spot on. As a guide, any diameter 0.5 inch (12.7 mm) or smaller should use the wire formula 234/f (f in MHz) while, for larger diameters, the lengths should be multiplied by 0.98.



The base of the mast supporting the 20 m ground plane antenna.

Tapered elements are a special case. The tapered element is longer than normal. The amount of correction depends upon the amount of taper. The length of the tapered element is between the length obtained from the wire formula and that calculated for the base diameter.

Don't worry too much about all these findings as, in practice, adjustment of either radial or radiator length compensates for the other. In other words, if the vertical radiator is too short then the radials are made longer. The reverse is also true. The author has tried both ways with his GP and no difference in performance was noted.

Work on the formulas mentioned before and apply the one that is appropriate to the aluminium type used. No matter which way it's done, you are close to the mark when the radials measure 0.25 of a wavelength using 234/f. Mark a line on the mounting pole measured down from the feedpoint. The radial wires should be all the same length and these can be checked against this marker line.

It's very convenient to have a plug and socket at 0.5 of a wavelength from the feed point to check the VSWR.

The experimenter can try some of the following ideas for TVI reduction and performance tests. The background noise on your receiver can be noted also during any experimental stages and, in particular, when the radials are longer than 0.25. The radiator is then made shorter to compensate.

Increase the length of just one radial wire only. Start with about 15 to 30 cm on 20 m. Check the TV set for TVI from 20 m and check the TV set for TVI at different lengths as you go. An alligator clip and wire will aid this test.

Install either a current balun, or wind the coaxial cable through a suitable size toroid for three or four turns as seen in the photo. The coil should not be so small as to strain the coaxial cable.

Increase the length of the radials to 0.5 of a wavelength but retain one radial at 0.25 of a wavelength to maintain correct current feed.

Increase the radials to a length of 0.75 of a wavelength or, if you are really adventurous, try two full 1.0 wavelength loops as a radial system. These can be in a diamond configuration and joined to the braid at each tip of the loops. These loops would probably need to come down at a angle.

Use one very short radial, for example 0.25 of a wavelength long, load this with an inductance, then link couple the coaxial cable to this coil. The radial could be linear loaded instead. This method was tried by the author some time ago with success.

An antenna as simple as the old ground plane. Who would have thought you could do so much! Happy experimenting.

References

Dx Vertical Up or Down; Adrian Fell VK2DZF; ***Amateur Radio*** *December 1995 p15*

ARRL Antennas Publications

All about Vertical Antennas; William Orr W6SAI and Stuart D Cowan W2LX

HF Antennas for All Locations; RSGB; LA Moxon G6XN.

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■ Transmitters

The Garran 40 m CW QRP Transmitter

Peter Parker VK1PK describes a very useful homebrew QRP transmitter using a VXO.*

While one often sees designs for simple QRP transmitters in various magazines, a large proportion appear to be built, and then left to sit on the shelf after just a few torturous contacts. Several reasons exist for this situation. The rig may be crystal locked in a band which is either sparsely used or crowded with DX stations. Its power output may be insufficient given the antenna system being used. Or the transmitted signal may be riddled with clicks or chirps.

This transmitter suffers from none of these maladies. It includes a VXO to provide some frequency agility to dodge interference, while preserving good stability. Its one watt output is sufficient for solid interstate contacts during the day, and the use of buffering makes this transmitter sound "just like a bought one".

Unlike most homebrew QRP transmitters, this unit operates on 40 metres. During the day this band can be a QRPer's dream; no DX QRM, plenty of activity (at least in SE Australia), and yet enough band space in which to call CQ (even in the limited range provided by a VXO). Antennas can be smaller than on 80 metres, and portable operation during the day is practicable.

Design

This transmitter is of conventional design (see Fig 1). A Colpitts VXO circuit permits a frequency shift of 4 to 5 kHz with excellent stability. The oscillator signal is fed to a buffer stage to isolate the VXO from the driver and power amplifier stages, whose collectors are both keyed by a PNP transistor switch. This transistor also controls the antenna switching relay and the LED keying indicator. Harmonics are suppressed in the pi-network following the PA. Spectral purity is further enhanced through the use of a 7 MHz tuned circuit on the driver transistor's collector. During reception, the entire transmitter is switched off to prevent interference in the receiver from the crystal oscillator which runs continuously during transmit.

. . . this unit operates on 40 metres. During the day this band can be a QRPer's dream.

Component Procurement

All components used in this transmitter are obtainable by mail order. If all are purchased new, the total cost of the rig should not exceed $70 (including crystal). By making the box and using salvaged components, this cost can be significantly reduced. Appendix 1 gives a list of addresses from which the more esoteric components can be obtained.

The most expensive part used in this transmitter is the crystal. Crystals in HC6/U holders normally exhibit the most frequency shift in VXO applications. Order your crystal for a standard 30 pF load capacitance. A crystal of 7.020 MHz proved satisfactory in the prototype.

The next component which may be hard to obtain is the variable capacitor. The prototype used an air-dielectric unit plus a 6:1 vernier reduction drive. A small transistor radio plastic dielectric type, available from most outlets, should be satisfactory. The value of this is not especially critical. Because of the small VXO shift, typically 5 kHz, a vernier reduction drive is an unnecessary luxury. At the time of writing, air dielectric types with in-built reduction drives are available by mail-order from the *CW Operators QRP Club.* If you're not a member of this club, include $12 with your first order to cover annual membership and *Lo-Key* subscription.

Three toroids are used in this transmitter. Again they are available from the *CW Operators QRP Club.* If you do not have many toroids, you could substitute a 1 μH RF choke for the toroid in the pi-network. An RF choke could also be used for the VXO inductance in series with the crystal. Experiment with values between about 5 and 20 μH. The enamelled copper wire required for winding the toroids can be found in old transformers, or is available in small reels from most part suppliers.

A wire gauge of 0.5 to 0.8 mm would be satisfactory. Both the trimmer capacitor and ferrite bead can be purchased from normal part suppliers or salvaged from an ex-commercial VHF FM transceiver. The PNP keying transistor can be any medium-power type as it is not critical. Some experimentation with the PA transistor might be fruitful. Replacing the 2N3053 with a 2N3553 or BD139 might boost output power to two to three watts. This modification has not been tried.

Construction

The first step in building this transmitter is to obtain a suitable box. To provide proper shielding a metal case is suggested. A size of 6 x 15 x 12 cm is reasonably compact while allowing room for a direct conversion receiver which can be added later.

Any one of a variety of construction methods can be used to build the transmitter. It is hardly necessary to etch a printed circuit board though should this be your choice, the use of pieces of adhesive tape as a resist is practical. Another approach is the use of Drew Diamond's "Paddyboard" construction (*Amateur Radio*, February 1995). The prototype uses three small pieces of perforated matrix. On one board the VFO and buffer stages are mounted. The second board carries the driver, PA and pi-network. The keying transistor

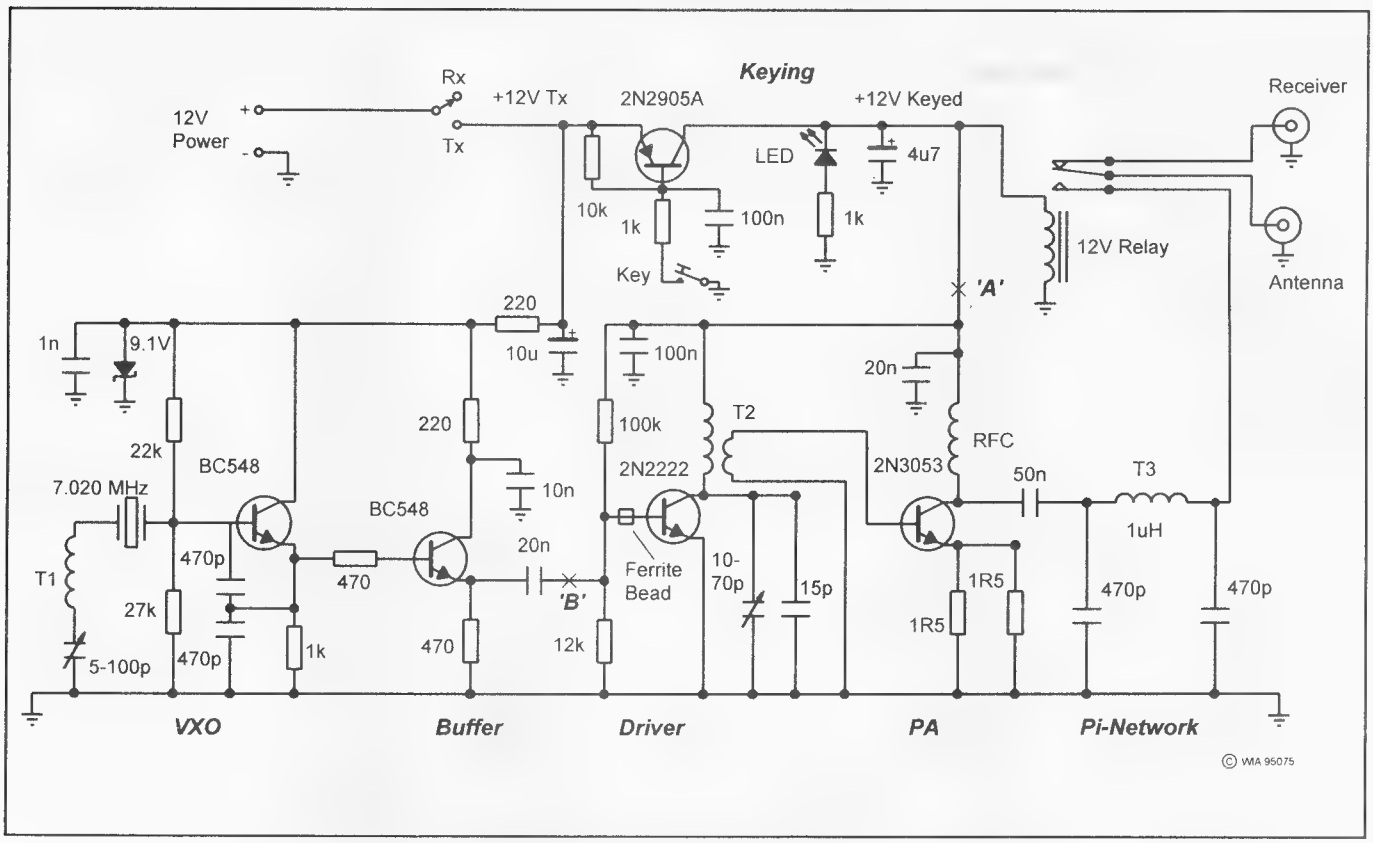

Figure 1 — Schematic diagram of the Garran 40 m CW QRP Transmitter.

Resistors:	**1/4 W 5%**
Capacitors:	**Below 1 μF, ceramic**
	Above 1 μF, electrolytic
	Variable, see text
Coils:	**T1 toroid 30 turns, see text**
	T2 toroid primary 17 turns, secondary 4 turns, see text
	T3 T50-2 toroid 14 turns, or 1 μH RFC, see text
Xtal:	**7.020 MHz, see text**

and relay are mounted on the third board. If blank matrix board is unavailable it can be produced by immersing veroboard in PCB etchant solution.

The VXO and buffer is constructed first. To maximise VXO range, it is recommended that no crystal socket be used; solder the crystal pins directly, but do not apply excessive heat. If using a printed circuit or matrix board use PC pins for all connections to panel-mounted sockets, the switch and LED, and other circuit boards. This facilitates construction, testing and trouble-shooting.

It might also be helpful to use PC pins for connections to the three toroids used in this project in case there is a need to vary the number of turns from those specified here. This is particularly true for the inductance in the VXO stage which should be experimented with to provide a good degree of shift with your particular crystal and variable capacitor.

The VXO and buffer stage can be tested by applying power (a 12 V gel battery is an ideal power source for this project) and checking for output with either a 40 metre receiver or digital frequency counter. Adjusting the variable capacitor should cause the output frequency to vary. The extent of frequency shift obtainable depends, among other things, on the inductance in series with the crystal and the minimum capacitance of the variable capacitor. Most shift in a VXO occurs near the minimum capacitance end of the variable capacitor's range. While the VXO toroid in the prototype contains 30 turns, you might achieve better results with a different number of turns. Aim for the maximum possible shift consistent with good frequency stability.

Next the driver and PA stages can be tackled. Firstly wind the driver and PA interstage toroid. Its primary contains 17 turns, while four turns are wound on the secondary. Remember to slip the ferrite bead over the base lead of the 2N2222A to minimise the risk of spurious oscillations. While the driver transistor runs fairly warm in this circuit, a heatsink is not required for normal CW service. The PA transistor, however, must be fitted with a heatsink; the type which presses onto a TO5 transistor case will be found suitable. The performance of these stages is dependent on the tuned circuit following the driver stage. It must be resonant on 7 MHz for the rig to work properly.

Following the PA is the pi-network.

The toroid for the prototype is an unknown 12 mm diameter powdered iron type. 22 turns were required to reach the desired 1 μH inductance. The commonly specified T-50-2 toroid would require 14 turns in this application. As mentioned previously, a small 1 μH RF choke would probably work as well, although this has not been tried.

At this stage of the transmitter's construction, a 40 m receiver, RF power meter and dummy load are necessary for testing. When power is applied, the signal produced in the VXO and buffer stage should be audible in the receiver. With the receiver's attenuator switched in, the application of +12 volts to Point "A" should cause some response in the receiver, and an indication on the power meter. Approximately one watt output should be indicated. If the output is significantly less than this, check the driver tuned circuit and experiment with component values around the driver and PA stages. If you are without a power meter you could try a 47 ohm, 1/4 watt resistor as a dummy load. If it gets hot when DC is applied to point "A", you can at least be sure that there is some output from the power amplifier.

It might be a good idea to tune your receiver off-frequency and listen for any broadband hash with point "A" at +12 volts. If this effect is noticeable, there is a need to make modifications to the driver and PA stages to curb spurious oscillations. Any of the following may help:-

- Ferrite bead on base lead of 2N3053.
- Low value resistor from 2N3053 base to ground — experiment with values from about 22 to 220 ohms.
- Increase value of 2N3053 emitter resistors.
- Insert low-value resistance in 2N2222A emitter.

The prototype required none of these modifications.

The most difficult parts of the transmitter have now been built. All that remains is to construct the transmitter keying stage. Its testing is very easy. With the power switched on, pressing the key should cause 12 volts to appear on the 2N2905A collector, activating the relay, LED, and the driver and PA stages. RF power should be measurable on the antenna socket with the key pressed. If there is no indication, look for wiring errors around the relay. With the receiver connected to the appropriate socket on the rear of the transmitter, normal reception of signals should be possible with the transmitter switched off.

Approximately one watt output should be indicated.

Operating

Once satisfied with the quality of the keying and the transmitter's frequency stability, it is time to connect it to a suitable antenna (via an ATU if necessary) and attempt to make some contacts.

If responding to a calling station, switch on the transmitter (without pressing the key) and adjust the VXO until a tone of the same pitch as that of the calling station is heard in the receiver. You are now on that station's frequency and may make your call. If using other than a superhet receiver with a good crystal filter, you should also check that both the calling station and the VXO signal zero beat on the same frequency; the "audio image" of simpler receivers can sometimes mislead the operator.

While a transmitter such as this is capable of reaching distances of up to 3000 km in the early evening, such contacts are often not easy because of interference from other stations. A much better time to operate 40 m is during the day when solid contacts of 600-800 km are possible with low power.

References

- O'Donnell, *Lo-Key*, June 1987, page 21.
- DeMaw/Hayward, *Solid State Design for the Radio Amateur*, 1986.

Appendix 1

List of Component Suppliers

- J & A Crystals,
20 Delville Ave,
Mentone, VIC 3194 Tel (03) 9583 4533
- Beacon Crystals,
24 Stanley St,
Leabrook, SA 5068 Tel (08) 9332 3031
- Max Howden Crystals,
PO Box 287,
Lilydale, VIC 3140 Tel (03) 583 4533
- CW Operators' QRP Club Kit-Set Centre,
C/o Don Callow VK5AIL,
5 Joyce St,
Glengowrie, SA 5044 Tel (08) 295 8112
- Dick Smith, Jaycar, Altronics, Rod Irving, Radio Spares, Force Electronics, etc — see electronic magazines and local Yellow Pages.

Appendix 2

Adding a Direct Conversion Receiver

This transmitter has been designed to easily permit the addition of a direct conversion receiver to form a complete transceiver. All that is required is to feed a small amount of signal from the buffer to the receiver's product detector via a 10 pF disc ceramic capacitor connected to Point "B". The 800 Hz transmit/receive frequency offset is accomplished manually by the operator adjusting the VXO when switching to transmit. The addition of sidetone and receiver muting features is a matter for personal choice.

***(Technical Editor's Note:** Those who find relays clicking in time with their keying annoying, should connect the relay to the 12 V line rather than to the keyed 12 V line.)*

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■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

VFO with Automatic Level Control

A VFO with an Automatic Level Control was described in the October 1995 issue of the **Radio Society of Great Britain's** monthly journal *RadCom* by Jack Hardcastle G3JIR. This VFO uses ALC to stabilise the output level of the oscillator thereby minimising drift after frequency changes. Variation of output level results in small changes which show up as drift following a change of frequency.

The main cause of drift is thermal due to the circuit warming up and due to heat from sources such as final amplifiers. These can be minimised by good design.

The circuit described is a form of Vackar VFO using a low noise VHF Dual Gate MosFet. The circuit is shown in Fig 1. The control voltage for stabilisation of the amplitude of oscillation is applied to gate 2. A combination of air variables, silver mica and ceramic N750 capacitors are used to compensate the oscillator for thermal drift.

The oscillator inductor L1 is wound with 0.25 mm (0.01 in/32 SWG) enamelled wire on a 14 mm (9/16th in) ceramic former. The wire was wound whilst hot so that it would be a very tight winding and so the former would determine any subsequent thermal movement and hence drift. The wire was heated during winding by passing 4 amps through it.

Voltage on gate 2 controls the output level. Trimpot RV1 sets the output level. The range available is from the oscillator squegging, through normal oscillation, to the oscillator stopping. The trimpot should be set in the mid range to give a suitable output level without any undesirable side effects.

After adjustment of the temperature compensation the following drift rates were obtained while heating the oscillator five degrees C above ambient over a two hour period. At 4.0 MHz the drift rate was −22 Hz/°C with +28 Hz/°C at 4.35 MHz and +8 Hz/°C at 4.175 MHz.

The oscillator output was relatively pure with the second harmonic down 30 dB. The third harmonic was down 35 dB and the fourth and fifth harmonics were down 54 and 55 dB respectively.

Oscillator output was set at +8dBm and was used to drive an SBL1 mixer.

Pirate Radio

An item from the July 1995 issue of *Short Wave Magazine* may be of some interest. In the *Off The Record* column of Andy Cadier there is some information regarding a crackdown on FM broadcast band pirates in the London Borough of Hackney.

The Borough of Hackney has been assisting the Radiocommunications Agency (SMA equivalent) in a crackdown on pirate broadcasters. The pirates have been unwelcome tenants or squatters in tower blocks of flats owned by the council.

Pirate transmitters have been located in the tower blocks with the studio at a remote site. The transmitters have been concealed in a variety of places including lift shafts, water tanks, and sewerage pipes. The pirates have not been ideal residents and their operations have sometimes resulted in expensive damage to the blocks of flats.

The United Kingdom, Ireland and Europe have had many pirate broadcasters. The pirates usually try to fill a broadcasting niche and, in the past, broadcasting to a wide area on the MF broadcast band required quite a lot of expensive equipment. The modern pirates appear to be catering for small local audiences on the FM band. The equipment requirements are much more modest.

A recent episode of *The Bill* on ABC TV featured a modern FM band pirate. The transmitter was located in a vacant tower block flat and the studio was remote. The link was a simple gunnplexer microwave communicator system. When the police and the Radio Inspector finally burst in only the transmitter was to be found. This is no doubt that this was

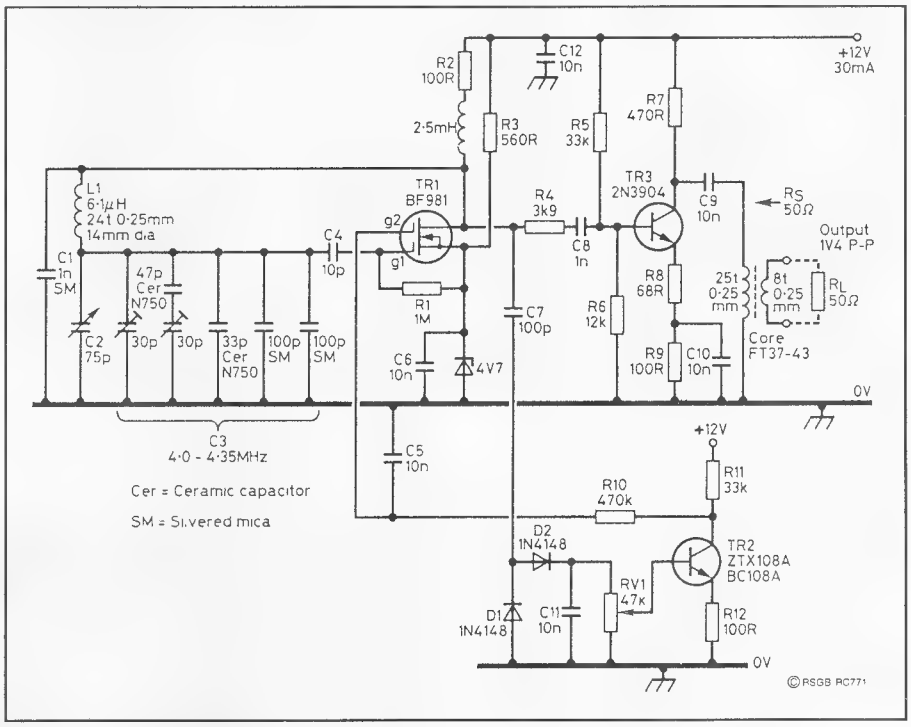

Fig 1 — Vackar VFO with ALC.

Table 1
Dual Band Handheld Transceiver Test

		Alinco DJ582T	Icom IC-Z1A	Kenwood TH79A(D)	Standard C568A	Yaesu FT-51R
Rx Sens dBm for 12 dB SINAD	146 MHz	-124	-123.5	-124	-124 (L) -120 (R)	-123.5
	440 MHz	-123	-123	-123	-122	-123
	1240 MHz				-117	
Rx AM Sens dBm for 10 dB(S+N)/N		-108		-114	-112	-114
Two Tone 3rd Order IMD Dynamic Range dB	146 MHz	63	60	62	66	62
	440 MHz	61	60	67	66(L) 61(R)	61
Adj Channel Rejection 20 kHz Offset dB	146 MHz	62	63	56	58	66
	440 MHz	58	61	53	51(L) 55(R)	58
Mute Sens dBm		-129	-126	-126(146) -129(440)	-131 to -122	-122
Rx Af OP mW into 8 Ω 10% Dist		210	190	211	202	151
Tx Pwr Watts Std Batty	146 MHz	3.5/1.6 /0.5	1.8/0.5 /0.02	3.2/0.4 /0.03	3.2/2.4 /0.4/0.07	2.4/2.0 /.5/0.03
	440 MHz	2.3/1.1 /0.3	1.6/0.6 /0.03	2.5/0.2 /0.03	3.6/2.0 /0.3/0.06	1.4/1.4 /.5/0.02
Tx Pwr Watts 12 V/13.8 V Nom Batty	146 MHz	5.2	5.2	6.4	5.4	5
	440 MHz	4.7	4.9	5.4	4.7	4.2
	#1240 MHz				0.05	
Tx Rx Turnaround Time PTT release to 50% Full Audio m/S 146 MHz	Squ On	140	160	205	160(L) 170(R)	125
	Squ Off	120	160	205	160(L) 170(R)	125
Tx Rx Turnaround Time PTT release to 50% Full Audio m/S 440 MHz	Squ On	100	160	205	160(L) 170(R)	110
	Squ Off	80	160	205	160(L) 170(R)	65

the sort of setup that is being chased in the London Borough of Hackney. The police in *The Bill* finally got their man due some other nefarious activities he was engaged in.

Comparison of Dual Band Handhelds

A comparison of Dual Band Handhelds was published in the July 1995 issue of the **American Radio Relay League's** monthly magazine *QST* in which five handhelds were compared. The author was Steve Ford WB8IMY and, in addition to the features and usage data, the handhelds were tested technically.

The handhelds tested were all purchased normally and were not special review samples. They would be representative of the sort of radio a user would obtain over the counter. This is standard for *QST* reviews and ensures that the test samples are similar to those which a normal purchaser could expect.

The performance figures obtained are given in Table 1. Some handhelds have AM detection when monitoring the aviation frequencies below the two metre band and the Standard provides a limited 23 cm coverage. The Standard also has a left and right side receiver which have slightly different characteristics.

The figures do need some interpretation. Sensitivity quoted in microvolts has been converted into dBm. Sensitivity is not the sole indication of good performance. Intermodulation has a great bearing on the ability to receive signals. The disturbance experienced from adjacent services is a frequent cause of complaint.

All the handhelds tested have intermodulation performance which could be improved. Bells and whistles should not be heard from the speaker of a radio due to disturbance from other services. The radio should be designed so that it can operate in the sort of RF environment that exists today. The problem of strong signals from services in adjacent bands is not solely an Australian problem.

The turnaround time gives some indication of the delay between transmit and receive. This is of importance to packet users and determines some of the TNC parameters. The major factor in these times is the settling time of the Phase Locked Loop. Good data cannot be handled until the PLL has stabilised. In many radios the PLL must shift frequency between receive and transmit and so must be allowed time to stabilise after each transition.

*C/o PO Box 2175, Caulfield Junction VIC 3161

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■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

Not everyone can put up a full size antenna, especially at the lower part of the HF spectrum. Mark VK4MFX writes of his experiences with a very limiting QTH, that of a yacht.

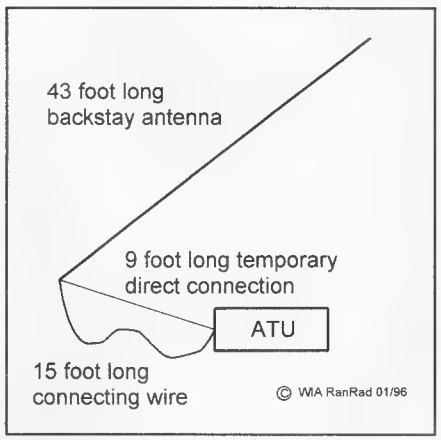
I found the Random Radiators *article in the June 1995 issue of Amateur Radio very interesting. Living on board a yacht, the antenna I use is a random wire, end fed, which I found worked very well on all amateur HF frequencies, plus the marine 4, 6, 8 and 12 MHz frequencies. The ATU I use is the MFJ948 "Deluxe Versa Tuner II". I've enclosed a section of wire which I've used as my antenna.*

Questions I would like to ask are:

1. *what is the capacity of the wire? and*
2. *what would be the impedance?*

*From my drawing (*Fig 1*) the 15 foot long connecting wire is the antenna wire coming into the chartroom. I found, when I am trying to operate this system on the 2.524 MHz marine frequency, that I am unable to bring the SWR down. As an experiment I rewired a line straight from the antenna to the ATU. This shortened the connection to the antenna by approximately six feet and the SWR on 2.524 MHz fell to 1:1. I called Townsville Radio for a report and was able to QSO on five watts. Although the connecting wire to the antenna was shorter, I can only put the improved performance down to the fact that the wire from the antenna to the ATU was at right angles to the antenna and pulled tight, whereas the other wire had a few turns, etc thereby raising the X_c of the wire. I can only assume that with the excessive X_c the ATU is unable to tune it out. Is this correct?*

Also in your article you talk of matching loads, ie "when matching loads of less than 25 ohms on 80 m ....". *I assume you are talking about impedances, ie a quarter wavelength vertical has an impedance of approximately 35 ohms.*



At present I have had to rewire the antenna connecting wire back to the original 15 foot length because to leave it as the direct nine foot line, the wire went right across the cockpit at waist height which was not very convenient (hi hi). This means, of course, I have lost 2.524 MHz. Although this doesn't present a problem, my question is why and how does this work?

In regards to R_R I would assume that you could use the formula $R_R = h^2/312$, where h = antenna length in electrical degrees. Of course R_R is going to vary over different frequencies.

As far as Zo is concerned, can the formula be $Zo = H°[\ln(4h/d)-1]$, where H° = length in electrical degrees, h = length in inches, and d = diameter in inches (taken for the ARRL Antenna Handbook, 16th Edition, 2-39)?

Living on a yacht, one's antennas become very limited, either end fed wires or verticals; therefore, any help in these two areas would be very much appreciated. For now, however, I would like to concentrate on understanding end fed antennas coupled with the ATU.

Mark has raised an interesting practical point. Why, when the antenna was shortened, did it load up on the lower frequency?

In answer to his first questions about the wire, the answer is I don't know. The wire did not arrive with the letter.

The capacitance of a wire depends on its diameter, when in free space, and its proximity to conductors and dielectrics in a practical situation. In other words the capacitance of a wire above ground is influenced by its height above ground.

The impedance depends on the capacitance per metre and the inductance per metre of the wire.

Even if we could calculate these parameters very accurately, in the installation that Mark has, the results would be little more than academic. The first thing to bear in mind is that the antenna and the feed line are part of the antenna system. In this case there appears to be no feed line as the antenna wire comes straight to the ATU. I assume that the ATU is stoutly grounded to the hull of the yacht and that this is metal. The other possibilities will be considered later.

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The total wire length is about 20 m of which about 13 m is the back stay radiator. When the wire goes direct to the ATU the whole wire will act as a short bent antenna. The ATU can apparently cope with this. When the wire is put into a more convenient position, it has some bends which will add inductance, but my guess is that it is closer to the metal hull and the sea and looks more like a transmission line of perhaps 1 kilohm impedance. This will transform the impedance of the back stay radiator to some new value at the ATU, which it apparently can't cope with.

Often we use this transformation property of transmission lines to arrive at a desired value of impedance, but if it was not planned then the result might be unhelpful. While it is possible to accurately calculate the effect for a transmission of constant impedance, it is probably impractical to even try for Mark's case.

The input resistance of the back stay will be about five ohms, but there will be a capacitive reactance which will be much greater in magnitude. Adding the extra 4.5 m of wire will increase the resistance to about nine ohms and the series reactance will reduce by about 25%. This is apparently within the capability of the ATU.

While it would be possible to more accurately calculate the impedances of the wires, not enough information is available in Mark's letter. The formula he gives for radiation resistance is a good approximation for short verticals in free space over a perfectly conducting ground plane. It will be in error for a sloping radiator and, of course, Mark's installation isn't quite free space. But for a ball park figure it will do. The formula can't be used when the wire to the back stay is not well clear of the deck. No simple formula can be applied, but some of the antenna analysis computer programs based on NEC (Numeric Electromagnetic Code) might do the job; however, as stated earlier, it still might be too difficult to be worth trying.

Alternatively the impedances could be measured using an RF bridge. Of course, even when the wire is arranged for a more direct connection, the five metre section can be still considered as a transmission line, albeit one that radiates. It will have a higher impedance than the lower and longer arrangement due to reduced capacitance to the "ground" side. It effectively transforms the impedance of the 13 m sloper section to a higher value which the ATU can more easily tune.

When the wire from the back stay is closer to the hull it does not produce quite the same result. Even though it is longer, the antenna system cannot be tuned by the ATU. It is inconvenient to arrange the feed any other way, so what can be done? There are several possible practical answers.

One yacht owner I have spoken to said that in most installations the ATU was located immediately below deck under the low end of the back stay. A short wire is run to the ATU, through a watertight insulator in the deck in some cases, to give the shortest practical connection. A length of 50 ohm coax is used to connect to the rig which is in the cockpit or other convenient sheltered position. As the ATUs are designed to be waterproof, the occasional splash or spray does no harm. The coax can be kept out of the way and its length is not critical as it sees the correct load from the ATU. Also, the risk of RF burns and shock are reduced as only the exposed back stay presents a hazard.

A land-based marine radio operator told me he uses a 13 m wire fed at the end with the centre of a 50 ohm coax line. The braid is connected to a two metre long counterpoise. He has several of these with different alignments to avoid problems with nulls in the pattern at the higher frequencies. His ATUs will match this on frequencies as low as 2.2 MHz. Of course the coax connection is weatherproofed.

This installation could be used on board a yacht or by an amateur with space restrictions. It might also be good for portable operation. The use of a coaxial cable in this manner still allows a convenient installation and reduces the electrical shock hazard for the crew. It suffers from the same problems as any other feed system when a short antenna is used, namely a high SWR and perhaps awkward impedances for the ATU. It does offer the possibility of having no high voltages in the cabin which is a hazard with single wire feeders.

As before, the ATU should be as close as possible to the feed point as practical. If the ATU is next to the rig, some RF may be present on the outside of the shield. Problems with this can be reduced by placing six to 12 small RF toroids over the coax immediately adjacent to the ATU. They should be protected from exposure to salt air and water.

If it is necessary to use the wire around the edge of the cockpit, or if with the coax feed the ATU cannot tune at the lowest frequencies, then the antenna must be made electrically longer.

An inductor could be switched into circuit at the ATU to make the system resonant or at least to present an impedance value that can accommodated by the ATU. The inductor could be wound on virtually any plastic former and placed in a metal box to avoid detuning effects when it is moved or the operator comes close. A toroidal core might be even better, but it needs to be one of the larger ones. The disadvantage is that it will need to be bypassed for the higher frequencies, and the switch must carry the full antenna current.

Another answer is to add some top loading to the back stay so that it looks longer at the lower frequencies. A weatherproof coil connected between the top of the stay and a metre or two of wire run down the mast or up the mast or to any convenient point would do. As it is not going to carry much current it can have a smaller toroidal core. The size of the coils can be determined by experiment.

Now what if the yacht is wooden or fibre glass? How can the ATU be "earthed"? A large sheet of copper foil on the inside of the hull below the waterline could be used to make a capacitive coupling to the sea. This can be almost as good as the metal hull connection.

Living on a yacht might have some complications, but I'm sure it has compensations.

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EMC Standards Compliance Deadline, 1 January

The deadline for electrical, electronic, telecommunications and information technology equipment to meet set-down standards is upon us. From 1 January 1996, equipment which has to comply with Australian Standards covering RF emissions and RF immunity will have to begin carrying a special "CE" label to indicate compliance with the standards.

The EMC compliance regime parallels similar action in Europe, where it now acts as a "non-tariff" trade barrier to the importation of non-complying equipment. All equipment required to comply with the European standard, whether manufactured there or imported, now has to carry a special EMC "C" label.

The lack of mandatory Australian immunity standards had, in recent years, left the door open for television receivers to be imported, which are susceptible to interference from other signals, whether these arise from legitimate transmissions or unwanted electromagnetic pollution. Similarly, other items of equipment which generate electromagnetic pollution, or were susceptible to RF interference, had also appeared on the market in Australia.

There were concerns expressed by the Australian electronics and electrical industry that, with the announcement of the EMC compliance regime several years ago, Australia may become a dumping ground before EMC compliance took effect. However, few examples had been identified.

The current Australian Standards on emission compliance are: AS 1044-1992 on household electrical appliances, portable tools and similar electrical apparatus; AS 1053-1992 on sound and television broadcast receivers and associated equipment; AS 2064.1&2-1992 on Industrial Scientific & Medical radio frequency equipment; AS 2557-1992 covering vehicles, motor boats and spark ignited engine-driven devices; AS 3548-1992 on information technology equipment; AS 4051-1994 on electrical lighting and similar equipment; AS 4052-1992 on microwave ovens for frequencies above 1 GHz; and AS 4251-1994 which is a generic emission standard.

The RF immunity standards are: AS 4053-1992 covering sound and television broadcast receivers and associated equipment; and AS 4252-1994 which is the generic RF immunity standard.

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■ Book Review

Test Equipment for the Radio Amateur

Publisher: *Radio Society of Great Britain (RSGB)*
ISBN 1 872309 23 2
Author: *Clive Smith G4FZH*
Reviewed by: *Bob Tait VK3UI*

The third edition of this ever-popular publication has been completely revised, and includes many new designs and a whole host of PCB layouts at the back of the book. It is pleasing to note that this edition has deleted many of the old and outdated techniques, replacing them with practical, up-to-date test equipment.

There is now a separate chapter on oscilloscopes. In the previous issue, oscilloscopes were combined with modulation monitors. That has now become a chapter on modulation measurements, and has been expanded to include a deviation meter to build for HF and UHF. This meter covers the range 3 MHz to over 450 MHz.

Also included are an automatic gain compression meter and a modulation meter for SSB. A few of the old favourites, like wavemeters, current probes, signal sources and dip oscillators, have been revamped using more modern and readily available components.

In the chapter entitled **Wavemeters and Analysers** is a new spectrum analyser to build, which covers 0 to 90 MHz and is designed to interface with most oscilloscopes. The analyser incorporates a marker generator to provide either one or 10 MHz markers on the display. All the PCB patterns are available in the back of the book, and detailed construction notes are provided for this and other projects.

Most of the equipment described in this book is easy to construct from readily available components. Much of the designs are simple and easy to construct making them more affordable to the average radio amateur.

This book is a must for any amateurs who want to build their own test equipment or for the active home-brewer who wants to tune and align his equipment.

The review copy was supplied direct from the RSGB. Supplies should be available from Daycom Communications Pty Ltd and WIA Divisional Bookshops next month.

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Amateur Radio Annual Index 1995

A tremendous amount of absorbing reading was published in the WIA monthly journal *Amateur Radio* during 1995, much of it being accounts of WIA members' experiments, construction projects and experiences.

If you see an item in this 1995 annual index which you want to read, and you cannot locate, or do not have that particular issue of *Amateur Radio,* back issues of the magazine are available from the WIA Federal Office to current members at $4.00 each, which includes postage in Australia.

If a back issue is no longer in stock, photocopies of articles are available to current members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The WIA is always looking for technical and general interest articles from members. For further details on how to write and submit an article about your latest construction project, experiment or amateur radio experience, refer to page 18 of the August 1992 issue of *Amateur Radio,* or contact the editors at the WIA Federal Office.

The Publications Committee wanted to publish a comprehensive **five year** index of *Amateur Radio,* covering from **1991 to 1995,** but space is just not available to do this! However, if you would like a photocopy of that comprehensive five year index, it is available for $5.00 (including postage within Australia) from the WIA Federal Office.

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"ΤηερεΠσ σομε τηινγ ηερε φορ ψου, τηατΠσ φορ συρε. Ψου μαψ νοτ ρεαλλψ γο φορ ουρ θυιχκ ρεϖιεω οφ α χηοοκ–βανδ ριγ, βυτ τηερεΠσ ηεαπσ οφ οτηερ στυφφ ψουΠρε"

Radio and **Communications**

Incorporating radio and CB Action

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Yep, it looks like Greek to us, too. But lots of amateurs have told us in our 20-odd years that the hobby is heading that way. You buy a new rig and the manual may as well be in Sanskrit. In fact, many of them don't even come with a circuit diagram these days...

And just you try asking for a few answers from those in Important Positions. Most times the 'straight talk' will be in Swahili.

For an honest, no bull approach to amateur radio you need the authoritative source. Australia's *Radio and Communications* magazine really knows what's what, and *tells* it that way.

January's bulging issue starts with our legal beagle, Judicious Rex, examining the future of Morse. His is a truly fascinating insight... Then there's an opinion piece of another kind altogether from Ken Reynolds, VK3TVS... There's another Steve Ireland, VK6VZ antenna project for you to build... And a review of a new breed of Alinco... More on the Internet, a visit to the Andaman Islands... and loads more.

So cut the cackle, turf the gobbledegook, and go get R&C. Quick. While they're still hot. And have a happy, *informed* 1996.

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Happy New Year Everyone

ALARA will be twenty-one this year. The ALARAMeet in Perth in September will be a special one, and there are rumours of a Special Event station to celebrate ALARA's coming of age.

A reminder to members who have not renewed their membership. Now is the time to pay up or miss out! What do you miss by not joining ALARA? For a start, you will not see the very informative and entertaining quarterly newsletter produced by Dorothy VK2DDB, so you will not know about all the fascinating bits of gossip which never make their way into this column. If you are thinking of attending the ALARAMeet in Perth (28 and 29 September 1996) important information regarding accommodation will be published in the January *Newsletter.*

For those YLs who are not members, why join? Why not? Membership is not expensive. Twelve dollars does not buy much these days but, for that amount, ALARA offers you a year of fun and friendship and an easy way to meet other YLs on the air. For a few more dollars, sponsorship means you can get to know a YL in another country even though you may not have been able to contact that country on air. Such friendships often start with letters which lead to skeds and eventually eyeballs.

ALARA Sponsorship Secretary is Gwen Tilson VK3DYL, 3 Gould Court, Mt Waverley VIC 3149. At this time there are YLs in New Zealand and the United States looking for sponsors in Australia. Contact Gwen if you are interested.

Many countries have associations similar to ALARA, and news about contests, nets and other activities is regularly exchanged. Some states and areas hold monthly luncheons, or find other ways to get together and enjoy each others'' company. You do not have to be technically skilled to be a member. Some members certainly fall into this category, but many simply enjoy talking to friends on the air, and if you listen to YL nets you will hear conversations on many topics. You can even be a member if you do not have a call sign, joining the nets, etc as a second operator (OMs reading this, please pass this information on to your YL).

For information about membership please write to the Treasurer, Margaret Schwerin, PO Box 758, Dalby QLD 4405.

Official ALARA Net

The Official ALARA Net takes place on Mondays on 3.580 MHz (there has been consistent QRM on this frequency, so look above and below) at 1030 UTC (1000 UTC during daylight saving time). Other nets are listed in the newsletter.

Congratulations

ALARA YLs have many interests apart from radio, and for Marilyn VK3DMS that means stamps. Marilyn carries over her interest in radio to her stamp collection, and her "Radiomania" collection on the history and development of radio is becoming quite well known in philatelic circles.

Last October this collection was awarded a Large Vermeil medal and the Top Thematic Trophy at Sydney Centrepoint 95 National Philatelic Exhibition. This achievement was all the more remarkable as Marilyn lives in Mildura and rarely visits any of the cities, doing all her research and acquisitions via mail.

The Sydney event was the only national exhibition in 1995. The next one is in Melbourne in October 1996 where Marilyn hopes to go for Gold, if she does not take up an invitation to enter an International Exhibition at the same time in Taipei.

ALARA Contest

This took place in November, and results will be published as soon as available. From my location (North Queensland) conditions were not good, and 80 m was just about impossible. However, there was plenty of YL activity, and some very determined ladies planned to stay on air for the full 24 hours, so there should be some good scores.

JOTA

As always, ALARA was well represented at JOTA in 1995, but I have not heard any good stories. Maybe all were too exhausted after the weekend to send a report.

DX

Are there any members out there making interesting DX contacts? Please drop me a line (see address at foot of column) or send a packet message to VK4SHE @VK4RAT.NQ.QLD.AUS.OC. This column badly needs some DX input.

The 13th BYLARA Contest

Date: Thursday, 11 Feb 1996
Time: 19.00 to 22.00 UTC
Date: Saturday, 13 Feb 1996
Time: 10:00 to 13:00 UTC
Bands: 14.250 to 14.280 MHz; 21.350 to 21.400 MHz; 28.350 to 28.410 and 28.600 to 28.700 MHz.
Procedure: Call "CQ BYLARA Contest". YLs work YLs and OMs; OMs work YLs only.

Marilyn VK3DMS with part of her prize winning "Radiomania" stamp collection (see "Congratulations").

Exchange: Callsign, RS, Serial number (starting at 001 each day), name, and if you are a BYLARA member, (year 1994/5).
Scoring: five points per YL BYLARA member; three points per YL non-member; two points per OM associate member; and one point per OM non-member. Only one period of operation counts for each entry (either day). Logs must show the station being worked.
Entries: National Society log sheet (or similar) showing claimed score, and including declaration that the entrant has abided by her Licence Regulations, application, IARU Band Plans and the above rules. Entries for the non scoring day are welcome as check logs.

Entries must be sent to Ella Tugwell G0FIP, 67 Upper Kingston Lane, Shoreham-by-Sea, Sussex BN43 6TG, England, to be received by 4 April 1996.

Silent Key

I am sorry to have to report that Phil Burstal VK3KYL became a silent key late November 1995 after a long illness. Although not very active on air, Phil had attended the last ALARAMEET at Castlemaine (for the Saturday only) and had regularly attended the VK3 monthly luncheons prior to becoming ill. She will be sadly missed by her friends. Our sympathy to husband Ross VK3CRB and family.

*C/o PO Woodstock, QLD 4816

WIA News

Victory for *Amateur Radio* at World Radio Conference

The Amateur Radio Service won an important victory in terms of international frequency planning at the recent World Radio Conference, WRC-95, while consideration of Morse code qualification for amateur licensee access to bands below 30 MHz gained a reprieve.

The WIA's ITU Study Group and Conference Co-ordinator, David Wardlaw VK3ADW, was a member of the official Australian delegation to the Conference, which ran over four weeks from 23 October to 17 November, 1995.

In the lead-up to WRC-95 the New Zealand Ministry of Commerce proposed suppressing the ITU regulation RR 2735 concerning the requirement for competency in Morse code as an amateur licence qualification for operation below 30 MHz.

David Wardlaw reports that the New Zealand proposal was introduced in one of the working groups of the Conference, and not discussed at the more formal committee or plenary levels as a proposal as the matter was considered to be beyond the terms of reference for WRC-95.

In the working group discussions, reaction to the New Zealand proposal was mixed and the outcome was that consideration of Regulation RR 2735 on Morse code qualification for amateurs should be put on the agenda of a later World Radio Conference. It is now to be considered for the agenda of the 1999 Conference when "Article 32", which covers the international regulation of the Amateur Radio Service, is to be reviewed as part of the on-going simplification of the ITU radiocommunications regulations.

So, the Morse code qualification wins a reprieve — for four years. With World Radio Conferences now held at two-year intervals, WRC-95 delegates regarded that putting this issue on the agenda of the 1997 Conference was too early for the world amateur radio community and the various country's administrations to give it full consideration.

An important victory was achieved for the Amateur-Satellite Service, which is only mentioned in the international frequency tables by way of a footnote for bands from 430 MHz to 10 GHz, as this reduces the visibility of the allocation and there is a danger that the Amateur Satellite Service may be overlooked when a country's regulatory authority is planning allocations. Indeed, there are examples of some "near misses" when amateur-satellite allocations were overlooked in the past, and that includes Australia, said WIA Conference delegate, David Wardlaw VK3ADW.

There are two footnotes in the ITU frequency tables regarding the Amateur-Satellite Service — these are footnotes 664 and 808. Footnote 808 indicates the 5830-5850 MHz band as a secondary amateur-satellite (space-to-Earth) allocation, and footnote 664 indicates amateur-satellite allocations at 435-438 MHz, 1260-1270 MHz, 2400-2450 MHz, 3400-3410 MHz and 5650-5670 MHz as "less than secondary" allocations, in that immediate shutdown is required in the event of harmful interference.

During the relevant Conference committee sessions, David Wardlaw successfully lobbied, with assistance from Wojciech Nietyksza SP5FM of the IARU and the support of the Australian delegation, to have footnote 808 included in the table. As fortune had it, an additional footnote, number 915 — regarding a secondary amateur allocation at 120 GHz — was included in the move into the frequency tables.

This achieved a number of things, even though only a couple of presently little-used bands are affected. Firstly, it improves the visibility of the Amateur-Satellite Service to regulatory authorities around the world, and secondly, it achieves the objective of ensuring at least the 5830-5850 MHz and 119.98-120.02 GHz band allocations are not overlooked in future.

Additionally, it sets a precedent that footnotes regarding the Amateur Service should be included in the ITU frequency tables. David Wardlaw said that having the footnotes included in the tables has been a goal since WARC-79.

While these particular bands may not be immediately important to many amateurs, "The Amateur Radio Service needs to be visible. Frequencies useful to us are also useful to others," David Wardlaw said. A goal for future conferences is to have footnote 664 included in the table, to improve the visibility of the other amateur-satellite service allocations at 70 cm and the bands above.

More than 1200 delegates from 140 of the 184 member countries of the International Telecommunications Union attended WRC-95. The main focus of the Conference agenda concerned the Mobile Satellite Services. Another important element of the Conference was discussion on simplification of the ITU Radio Regulations.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):
Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/– QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Six Monthly Amateur Radio Satellite Update

Here is a list of current amateur radio satellite frequencies and modes. I have simplified the list by removing all reference to satellites that are defunct and by listing only the mode A transponders on the three most popular Russian RS satellites. If you are an RS satellite buff you can refer to the January 1995 column for full details of all the transponder modes on the RS series.

EuroMIR and Safex-2 Operations

This mission looks like being extended for an additional month or so. The frequencies and modes were published in the October 1995 column. At the time of writing, the 70 cm packet gear was not operational.

AMSAT-OSCAR-10, AMSAT-OSCAR-13 Situation Report for Newcomers

Many newcomers to the AMSATs will be anxious to sample the high altitude birds, AO-10 and AO-13. If you are a recent starter, you may not have caught up on the current situation regarding these two important satellites.

First, a bit of history. OSCAR-10 was launched in June 1983. Yes, it's over 12

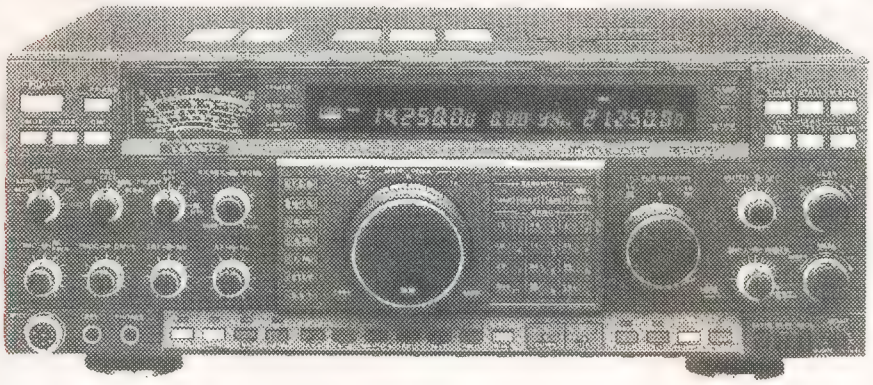
Satellite	UPLINK (MHz)	DOWNLINK (MHz)
Oscar 10 (AO-10)		
General Beacon (Carrier only)		145.808 (approx)
Mode B (SSB,CW-Inverting)	435.030-435.180	145.825-145.975
Do NOT use the transponder if the beacon signal is "FM-ing".		
Oscar 11 UoSAT-2 (UO-11)		
Beacon (1200 AFSK,FM) telemetry/bulletin		145.826
Beacon (1200 AFSK,FM)		435.025
Beacon (1200 AFSK,FM)		2401.500
Radio Sputnik 10 (RS-10)		
Mode A (SSB,CW-Inverting)	145.86-145.90	29.360-29.400
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Robot Mode A (CW)	145.82	29.357 or 29.403
Radio Sputnik 12 (RS-12)		
Mode A (SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Robot Mode A (CW)	145.831/.840	29.408 or 29.454
AMSAT-OSCAR-13 (AO-13)		
General beacon (400b PSK, CW, RTTY)		145.812
Engineering Beacon (400b PSK MA 0 to MA 40)		145.985
Mode B (SSB,CW-Inverting)	435.420-435.570	145.825-145.975
Mode S (SSB,CW,FM)	435.601-435.639	2400.711-2400.747
Mode S Beacon (PSK)		2400.664
Radio Sputnik 15 (RS-15)		
Mode A (SSB,CW non-invert)	145.858-145.898	29.354-29.394
Beacon (CW) 29.352.5		
AMSAT-OSCAR-16 (AO-16) Callsign = PACSAT		
Mode J (1200 BPSK BBS,FM-SSB)	145.90/92/94/96	437.025 or 437.050
Mode S (1200 BPSK BBS,FM-SSB)		2401.1 or 2401.1428
AMSAT-OSCAR-17 (DO-17) (Dove)		
Beacon 1 (1200 bps AFSK,Digital Voice,FM)		145.82516
Beacon 2 (1200 bps AFSK,Digital Voice,FM)		145.82438
Beacon 3 (1200 BFSK,Digital Voice,SSB)		2401.2205
AMSAT-OSCAR-18 (WO-18) (Webersat)		
Mode J (1200 BPSK,RC,SSB)	144.30-144.50	437.075 or 437.10
ATV (TV,AM)	1265.000	
AMSAT-OSCAR-19 (LO-19) Callsign = LUSAT		
(1200 PSK,FM-SSB)	145.84/.86/.88/.90	437.15355 or 437.1258
FUJI-OSCAR-20 (JAS-1b) (FO-20) Callsign = 8J1JBS		
Beacon JA (CW,Analog)		435.795
Mode JA (SSB,CW)	145.90-146.00	435.80-435.90
Beacon JD (CW)		435.910
Mode JD (1200 BPSK,FM-SSB)	145.85/.87/.89/.91	435.910
UOSAT-OSCAR-22 (UO-22) Broadcast Callsign = UOSAT5-11		
BBS Callsign = UOSAT5-12		
Mode JD (9600 Baud FSK,FM)	145.90/.975	435.120
KITSAT-OSCAR-23 (KO-23) Broadcast Callsign = HL01-11		
BBS Callsign = HL01-12		
Mode JD (9600 Baud FSK,FM)	145.85/.90	435.175
KITSAT-OSCAR-25 (KO-25) Broadcast Callsign = HL02-11		
BBS Callsign = HL02-12		
Mode JD (9600 Baud FSK,FM)	145.870	436.500
ITAMSAT-OSCAR-26 (IO-26) Callsign = ITMSAT		
Mode JD 1200 baud PSK	145.875	435.867
	145.900	435.822

As always, the list is as accurate as I can determine at the time of writing. Please let me know of any errors or omissions.

DICK SMITH ELECTRONICS

EX-DEMO CLEARANCE!

YAESU FT-1000



HURRY, VERY LIMITED STOCKS!

Now's your chance to get the 'Best of the Best' at a bargain price! Right now you can pick up an ex-demo FT-1000 deluxe HF all-mode transceiver and save $1000. Here's what the experts have to say about this incredible transceiver...

On Operation

" The layout of the front panel of the FT-1000 is just right...I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S." - ARA

" I found the FT-1000 easier to learn and use than any other radio in its class." - QST

On Documentation

" Clearly written and complete, and includes a complete set of schematics and many high quality photos." - QST

" The quality of printing and presentation of the book is the best I have ever seen..." - ARA

On the Receiver

"... this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." - QST*

"The direct digital synthesizer works very well and produces receiver performance that sets new standards." - AR

"I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation..." - ARA

Transmitter -SSB

" The FT-1000 is easy to adjust and use...The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports" - QST

Transmitter - CW

" CW keying was a delight... power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." - AR

" CW operation with the internal keyer is a breeze..." - QST

Conclusion

"...the FT-1000 represents unbelievable value..." - AR

" It's an excellent set worthy of accolades and rave." - ARA

" ... the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." - QST*

* Review with optional filters fitted.

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver and easy to use controls put it far ahead of the competition. Hurry in today and check out our limited number of ex-demo models all with a full 2 year warranty. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

$4995

(Ex-demo models only, microphone extra)

Interested in more information? Copies of our 12 page colour brochure are available upon request. Phone (1800)226610 or (02) 9373366.

SPECIAL OFFER

Purchase an FT-1000, and we'll provide an MD-1 Desk Microphone, SP-5 or SP-6 extension speaker, BPF-1 Band Pass Filter, TCXO-1 Temp Compensated Oscillator, and four 455kHz 3rd IF crystal filters for just $500 (valued at over $1300 if purchased separately) This offer is only valid from 28/9/95 when purchased with the FT-1000, and is subject to accessory availability.

Some models may be shop soiled. However all come with a full 2 year warranty.

Ex-demo models units are available at these stores:
Please phone to check availability.
North Ryde (02) 878 3855, Bourke St., Melb. (03) 9639 0369, Adelaide (08) 232 1200

DICK SMITH ELECTRONICS

Tune in With Top Performers!

FT-2200 2m Mobile Transceiver

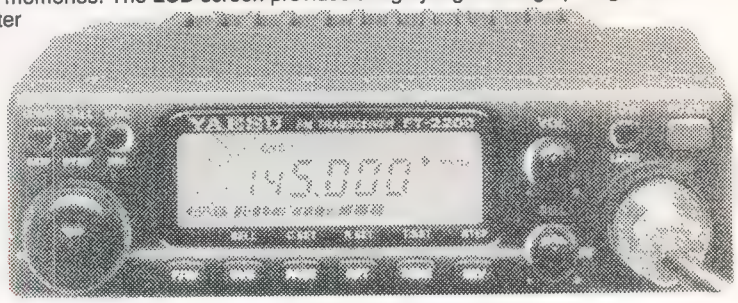
A compact, fully-featured 2m FM transceiver with selectable power output of 5, 25 and 50 watts, it includes the latest convenience features for more enjoyable mobile or base station operation. Built around a solid diecast chassis, it provides 49 tuneable memories, a large variety of scanning modes, an instant recall CALL channel, 7 user-selectable channel steps from 5kHz to 50kHz and is just 140 x 40 x 160mm (not including knobs). Backlighting of the large LCD screen, knobs and major buttons is even automatically controlled to suit ambient light conditions. Also provided is a 38-tone CTCSS encoder, DTMF-based paging and selective calling with auto page/forwarding features, and 10 DTMF auto dial memories. The LCD screen provides a highly legible bargraph signal/PO meter plus indicators for the various paging and repeater modes. An optional internal DVS-3 digital recording/playback board can also be controlled from the front panel, giving even greater messaging flexibility. Supplied with an MH-26D8 hand microphone, mobile mounting bracket and DC power lead.

Cat D-3635

$699

YAESU

2 YEAR WARRANTY



FT-990 HF All-Mode Base Transceiver

We're overstocked on ex-demo transceivers, so take advantage of this opportunity to save $500 on an excellent HF base-station rig! The FT-990 offers many of the features of the legendary FT-1000, only in a more compact and economical base station package. Together with clear front-panel layout and labelling, its large back-lit meter and uncluttered digital display allows for easy operation. The receiver uses a wide dynamic range front end circuit and two DDSs to provide a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM), with high duty cycle transmissions allowed. The internal auto antenna tuner and an in-built power supply are standard features, while the customizable RF speech processor and switched capacitance audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch filters, IF bandwidth selection, 90 memories and one-touch band selection.

Cat D-3260

Ex-Demo **SAVE $500!**

Only $3495 **2 YEAR WARRANTY**

LIMITED STOCKS

2m RF Power Amplifier

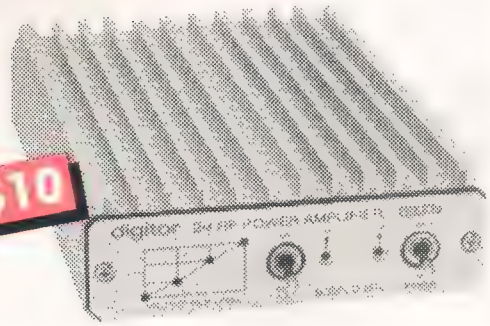
digitor

Boost your 2m hand-held's performance with this compact amplifier. Works with 0.3 to 5W input and provides up to 30W RF output, plus has an in-built GaAsFet receive pre-amp providing 12dB gain. A large heatsink and metal casing allow extended transmissions at full output, and a mobile mounting bracket is supplied for vehicle use. Requires 13.8V DC at 5A max. Size 100 x 36 x 175mm (W x H x D).

Cat D-2510

Still Only $129.95

SAVE $10



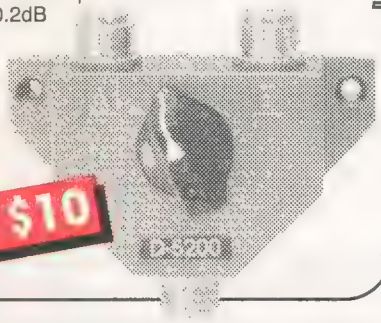
A Great Range Of Accessories!

2-Way Coax Switch

A heavy-duty, 2-way coax switch that's suitable for Amateur, CB or commercial applications. It's well constructed with a die-cast case and can handle up to 2kW PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

Cat D-5200

$29.95



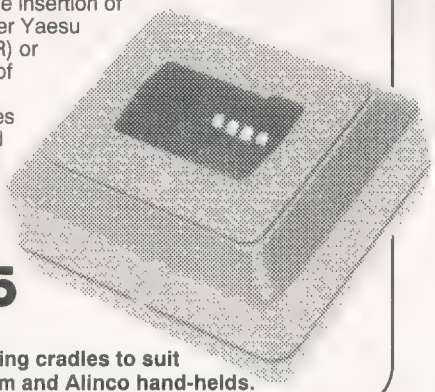
SAVE $10

Mastercharger 1 Fast Desktop Charger

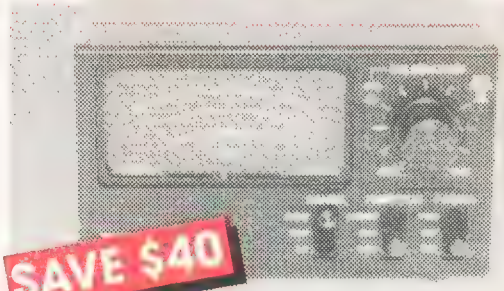
Made in the USA, the Mastercharger 1 is a compact fast charger that operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor IC (with -Δ V full charge detection) to safely charge NiCad batteries between 6V and 13.2V. Suitable for the FT23/73, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing the insertion of a new cradle to suit other Yaesu transceivers (eg FT-11R) or different brands/model of hand-helds. The Mastercharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use.

Cat D-3850

$129.95



Now available - Charging cradles to suit various Kenwood, Icom and Alinco hand-helds.



SAVE $40

Revex W560N HF/VHF/UHF SWR/PWR Meter

Quality Revex wide-band SWR meter, offering 2 in-built sensors for 1.8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), and SWR. Uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

Cat D-1375

$329

Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kW (PEP) power handling. Wide-band coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50ohm coax cable.

Cat D-4920

HUSTLER **$349**

PHONE, FAX & MAILORDER SERVICE & Yaesu Brochure Hotline
Outside Sydney (FREE Call) 1800 26 3922
Sydney and Enquiries - 9937 3366
Fax: (02) 805 1986 or write to:
Dick Smith Electronics, Mail Orders, Reply Paid 160
PO Box 321 NORTH RYDE NSW 2113
All major Credit Cards accepted. O/Nite Courier Available.
Yaesu stocks and some antennas not held at all stores, please contact your local store for availability, or phone 1800 22 6610

DICK SMITH ELECTRONICS

NSW • Albury **21 8399** • Bankstown Square **707 4888** • Blacktown **671 7722** • Bondi **387 1444** • Brookvale **9905 0441** • Burwood **744 7299** • Campbelltown **27 2199** • Chatswood **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **580 8622** • Kotara **56 2092** • Liverpool **600 9888** • Maitland **33 7866** • Miranda **525 2722** • Newcastle **61 1896** • North Ryde **9937 3355**• North Sydney (Greenwood Plaza) **9964 9467**• Orange **618 400** • Parramatta **689 2188** • Railway Square **211 3777** • Penrith **(047) 32 3400** • Sydney City York St **267 9111**& Mid City Centre **221 0000** • Tamworth **66 1711** • Wollongong **28 3800 ACT** • Belconnen **(06) 253 1785** • Fyshwick **280 4944 VIC** • Ballarat **31 5433** • Bendigo **43 0388** • Box Hill **9890 0699** • Coburg **9383 4455** • Dandenong **9794 9377** • East Brighton **9592 2366** • Essendon **9379 7444** • Frankston **9783 9144** • Geelong **232 711** • Highpoint **9318 6300** • Melbourne City City Strand Central Arcade **9663 5320** & 246 Bourke St **9639 0396**• Richmond **9428 1614** • Ringwood **9879 5338** • Springvale **9547 0522**• Wantirna South **9800 3455** **QLD**• Alderley **356 3733** • Booval **282 6200** • Brisbane City **229 9377**• Buranda **391 6233** • Cairns **311 515** • Capalaba **245 2870** • Chermside **359 6255** • Indooroopilly **878 4944** • Maroochydore **791 800** • Mermaid Beach **5578 5600** • Rockhampton **27 9644** • Southport **5532 9033** • Toowoomba **38 4300** • Townsville **72 5722** • Underwood **341 0844 SA** • Adelaide City Pulteney St **232 1200**& Myer Centre 231 7775 • Elizabeth **255 6099** • Enfield **260 6088** • St Marys **277 8977** • Westlakes **235 1244 WA** • Balcatta **240 1911** • Cannington **451 8666** • Fremantle **335 9733** • Perth City **481 3261** • Midland **250 1460** • Northbridge **328 6944 TAS** • Glenorchy **732 176** • Hobart **31 0800** • Launceston **344 555** **NT** • Darwin **81 1977**

*MAJOR AMATEUR STOCKISTS STORES SHOWN IN RED.

years old! It had a design life of about five years. It failed to achieve the planned orbit and, as a result, spends more time than it should in the vicinity of the Van Allen radiation belts. Eventually the radiation damage to the computer memory made it impossible for the control stations to maintain stability and switch the transponders. It was put into mode B using the last few remaining bytes of memory and has been out of control since that time.

Once attitude control was lost, it was no longer possible to position the satellite so that the sun shone most favourably on the solar panels. Normally this is a most important (and constant) part of the controllers' work. Nowadays, when the panels are fully lit by the sun, the transponder springs into life. When the angles are unfavourable the transponder shuts down. It went through some lean years but recently the attitude has drifted such that operation has at times been almost as good as during its hey-day. Please take note, however, that you should listen carefully to the beacon on approximately 145.808 MHz. If it is showing signs of instability, or it changes frequency when you uplink a signal, it means that the power available is becoming marginal. **Do not transmit to AO-10 under these circumstances.**

OSCAR-13 has largely escaped the ravages of radiation damage due to a better orbit and a radiation hardened main memory chip. Unfortunately, it is nearing the end of its life for a different reason. It, too, failed to achieve the planned orbit. As a result the orbit is "oscillating". The perigee point has come perilously close to earth on a number of occasions and the next time it takes a dive it will come too close and burn up in the atmosphere. It is estimated that this will happen in December 1996.

Failure of the 70 cm transmitter some time ago caused the demise of modes J and L. Modes B and S are still fully functional. It is under control and the three control stations, G3RUH, DB2OS and VK5AGR hope to maintain it in a healthy condition until it makes its final orbit. It may well come to pass that the "ol' timer" OSCAR-10 will outlast its younger companion.

OSCAR-10's orbit is quite stable and its perigee is high enough to not pose a problem. Between them these two satellites have done an extraordinary job for the AMSAT community and for amateur radio. They have been responsible for bringing amateur radio to the notice of the public and for gaining respect in the commercial satellite community. Their success has helped to spawn an increasing commercial interest in "small" satellites. The construction of a new flag ship, Phase 3d is well under way. It is due for launch later this year. It will usher in a new era as did OSCARs 10 and 13. To the designers, the constructors and the future controllers, BRAVO! And thank you one and all.

BTW

BTW, the Phase 3d building fund, is still short of its target and it's not too late to contribute. Please consider contacting Graham VK5AGR with a donation. A few dollars from each user and potential user would put a big smile on the faces of all those largely unsung, faceless people who contribute their time and expertise to the building, testing, launching and commissioning of amateur radio satellites.

Yet Another Tracking Program

They're coming thick and fast, folks. As I mentioned in the September column, there seems to be a never ending stream of satellite tracking programs coming "on-line" these days. Most are in the whiz-bang category and are nothing more than a pretty face. Next month I'll review a good one, a beauty in fact. It's called **SatSpy for Windows.** I came across it in the astronomy section of CompuServe and it would be particularly useful if you are interested in watching satellites just before dawn and just after sunset.

*359 Williamstown Rd, Yarraville VIC 3013
Packet: VK3JT@VK3BBS.#MEL.VIC.AUS.OC
CompuServe: 100352,3065

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WIA News

Heard Island DXpedition Put Back 12 Months

The proposed DXpedition to Heard Island has been postponed until 1996, probably for the month of November, according to advice from Peter Casier ON6TT.

The decision follows the collapse of the expeditioners' transport arrangements with the apparent disappearance of the vessel *Tallarook,* along with the owner and managing director of the shipping operator, Kris Mitchell of K&DM Transport, trading as Pioneer Cruises. A 5 December press report, in *Daily Commercial News,* said that the company has gone out of business.

Peter ON6TT, from Belgium, said in a fax to WIA Federal President Neil Penfold VK6NE, ". . . we mean business by delaying, not just "well, let's postpone (and) see what will happen. No, we are going ahead full speed!"

Peter praised the support and hospitality provided by the VK6 gang during the expeditioners' stay in Perth from late October through early November. He invited them to join the team of organisers for the 1996 expedition.

The WIA press release, issued to the print and electronic media on 4 November, bore fruit. The Perth-published *Sunday Times* carried a long story about the Heard Island expedition's plight on 6 November, which explained the disappearance of the *Tallarook* and the expeditioners' huge $AUS160,000 losses. The story was accompanied by a picture of Ralph Fedor K0IR with some of the expedition equipment. The *Daily Commercial News* article in December also made mention of the Heard Island expeditioners' loss, and said that the Federal Police fraud squad had been notified of the disappearance of Mr Kris Mitchell of K&DM Transport. The article also said the company was reported to have amounts outstanding exceeding $400,000.

In his fax to Neil Penfold, Peter Casier also said, "With your valued help and connections, our chances to succeed increase enormously."

The expeditioners have asked for assistance in finding another vessel, with new funding and sponsorship in Australia, preparation of certain equipment, and a PR campaign in Australia. WIA Federal is actively continuing with enquiries to find a new vessel, through President Neil Penfold VK6NE and Media Liaison Officer, Roger Harrison VK2ZRH.

Sign up a new WIA member today — use the form on the reverse side of the *Amateur Radio* address flysheet.

Club Corner

Ballarat Amateur Radio Group Inc (BARG)

1995 Ballarat Hamvention a Great Success

We promised you a great day at our '95 Hamvention and, judging from the comments we received, we were 99.99% successful. The new venue was a big improvement, apart from a small parking problem which is being addressed for next year. The weather was typically perfect and the fox hunters were hard at it all day Saturday working up an appetite for the Hamvention dinner which was attended by 70 people on the Saturday evening.

Apparently everybody remembered to reset their clocks for daylight saving time because the rush started very early Sunday morning as traders arrived to partake of the extremely popular free coffee before setting up 320 feet of trestles for stalls, and five prominent commercial trading tables. All stall holders reported good sales and seemed satisfied with the venue.

Once again the fox hunters were out and about with gusto as they got to know Ballarat and district the hard way. Nevertheless, we are assured that they enjoyed themselves and we promise them that fox hunting activity will be even better next year. We are already working on some improvements and sneaky ideas.

By mid-afternoon some 488 people had passed through the door and joined in the many activities and sampled the culinary treats produced by our ladies group. It was great to see old friends meet, and to meet up with new amateurs who, until then, had only been a voice on a loudspeaker or headphone.

Early next year we will be telling you about Hamvention '96. What an event that is going to be! Mark your calendar now for 26 and 27 October 1996, and book your accommodation early.

Doug Raper VK3VBA
Publicity Officer

Radio Amateurs Old Timers Club

As usual, there will not be a broadcast in January 1996.

Transmissions on 5 February and 4 March 1996 will be at 10.00 am EAST on 2, 40 and 80 metres. 20 metres beaming north will be at 0100 UTC; 20 metres beaming west will be at 0200 UTC.

Allan Doble VK3AMD
ar

AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

There was an article in a Honolulu newspaper recently concerning the proposed attachment of several islands in the vicinity of the Hawaiian group. The main thrust of the article says that a proposed House Resolution (H602), was introduced in Congress to extend Hawaii jurisdiction over four more islands, two atolls and a reef with a patch of sand 133 feet long and an underwater footprint that stretches nine miles. Added to Hawaii would be Baker and Howland, Jarvis, Palmyra Atoll, Kingman Reef, Johnston Atoll and Midway. The whole package contains only seven square miles of actual land or sand, but it would give Hawaii 322,000 more square nautical miles. Except for Palmyra, all the land is Federal land. If this proposal is passed and accepted, it would mean the deletion of several "countries" from the DXCC list.

The ARRL will be abolishing the current DXCC program as we know it by the year 2000, and will be replacing it with the new **ARRL DXCC2000** where there will be a one time award for 100 countries, and no more multi-band, 5-band, Honour Roll or #1 DXCC, just a basic 100 country DXCC award with NO extras.

Those amateurs waiting on decisions regarding Pratas Island and Scarborough Reef will have to cool their heels a little longer. I will pursue these matters, and report when I have information. In the meantime, IOTA number AS-116 has been issued for Scarborough Reef.

VI7SRAAF

This special event callsign, which will go to air on 1 February 1996 and conclude on 31 December 1996, commemorates the 75th anniversary of the RAAF. The station will be activated solely by members of the Air Forces Amateur Radio Net. The RAAF, in collaboration with AFARN, have produced a very attractive

ICOM Count on us!

"VK3LZ calling!"

More sound information from your friends at Icom

Packet rigs

The following rigs are designed to operate with packet specifically in mind : IC-281H (2M mobile), IC-481H (70CM mobile), and IC-820H (dual band base).

Up-to-date catalogues available

Catalogues tend to date rather quickly but currently we have an up-to-date one available, so secure your copy now!

23cm update

There have been delays installing the repeaters in Melbourne and Brisbane, but by the time you read this all should be operational.

Icom caps

The first one hundred IC-706s sold very quickly but the warranty cards are trickling in slowly. The caps will be ready as soon as the stragglers arrive.

Old rigs

Some particular spare parts for old rigs, (15-20 years ago), are very difficult to obtain. Please check with us before buying these second hand.

"...73"

Call me at Icom on
Freecall : 1800 338 915
Ph : (03) 9529 7582
Fax : (03) 9529 8484

ACN006 092 575

QSL card and Certificate which, in my estimation, is a must for award collectors. See the *QSP News* item, on page 50 of last month's *Amateur Radio* for further details.

The Southern Cross Award

Many radio clubs make awards available to operators who satisfy the criteria for making contact with their Club station and/or a requisite number of club members. The Eastern and Mountain District Radio Club (EMDRC) offers just such an award, The Southern Cross Award.

Contacts can be made with VK3ER on Wednesday evenings at 2000 hrs local time on 3.585 MHz, and via VK3BNW on Sunday morning at 0930 hrs local time on 28.340 MHz.

The Awards Manager is Frank VK3COF. Applications for this award can be sent direct to him, or through the Club, at PO Box 87, Mitcham, Victoria 3132 enclosing a certified list of contacts, and a $2.00 redeemable voucher of some kind. Now for the important details.

Requirements

VK stations require a total of 10 points. DX stations (including VK9 and VK0) require five points.

Contacts

Each club member contacted is worth one point. A contact with one only of the Club stations scores two points. A contact with the alternative Club callsign (if included in the same application) is worth only one point.

Conditions

A member may be claimed once per application regardless of any change of callsign between successive contacts. The only exception to this rule is a member operating a Club callsign who may also be claimed under his/her personal callsign, if separately contacted.

Cross-mode and cross-band contacts may be claimed but not contacts made via a repeater.

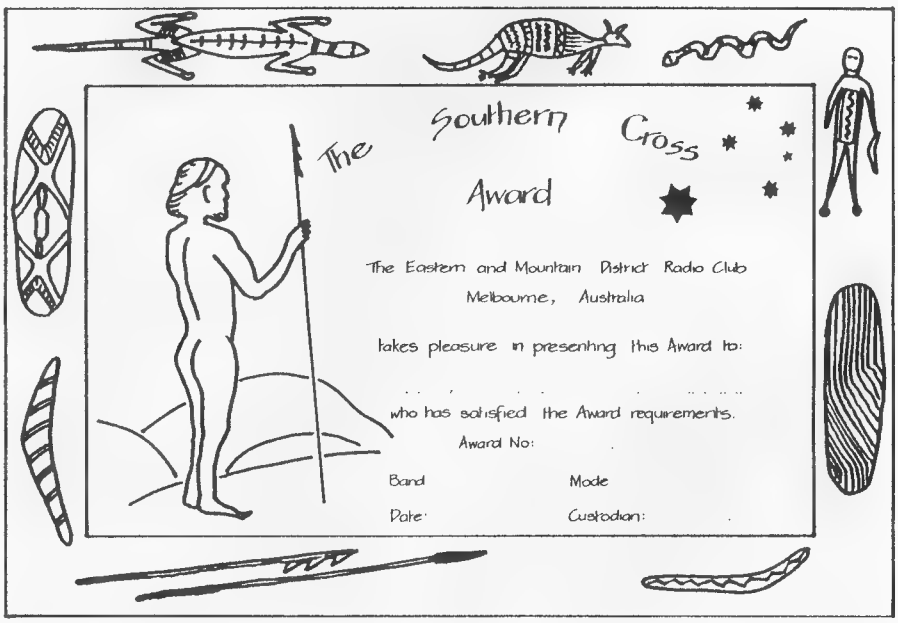
QSL cards are NOT required.

A list of current members' callsigns will be forwarded to anyone requesting it on receipt of a stamped, self-addressed, business-size envelope for VK or two IRCs for DX airmail.

This award is issued by the EMDRC, and is available to all licensed amateurs and SWLs who obtain the requisite number of points for working club members on or after 1 September 1985.

As all can see, the EMDRC, a very recognised Radio Club, has provided information on their award. I would deem it a pleasure to publish information from other active Club Stations.

*PO Box 2175 Caulfield Junction 3161



Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Jan — March 1996

Dec 27 to Jan 27	Ross Hull VHF/UHF Contest	Nov 95
Jan 1	ARRL Straight Key "Night"	
Jan 6/7	ARRL RTTY Roundup	Dec 95
Jan 13/14	VHF/UHF Field Day	Dec 95
Jan 21	HA DX CW Contest	Dec 95
Jan 26/28	CQ WW 160 m DX Contest	Dec 95
Jan 27/28	UBA SSB DX Contest	Dec 95
Feb 10/11	PACC CW/SSB DX Contest	
Feb 10/11	Spanish RTTY Contest	
Feb 17/18	ARRL DX CW Contest	
Feb 23/25	CQ 160 Metre SSB Contest	Dec 95
Feb 24/25	RSGB 7 MHz CW Contest	
Feb 24/25	UBA CW DX Contest	Dec 95
Mar 2/3	ARRL DX SSB Contest	
Mar 9/10	BERU CW Contest	
Mar 16/17	WIA John Moyle Field Day	
Mar 16/17	Bermuda Contest	
Mar 16/17	BARTG RTTY Contest	
Mar 23/24	CQ WPX SSB Contest	

One of the benefits of this job is that it gives me an opportunity to periodically earbash everyone about the need to prepare for contests well in advance, so that, come the big weekend, the best possible effort can be made. (The fact that I rarely take my own advice shall not be mentioned here).

However, with the CW leg of the CQ-WW rapidly approaching, I thought it was time for more than the usual passing nod to my operational junk box this year, and actually make some improvements for a change. In true contest spirit this meant waiting until the weekend before the contest, and then launching into a complete station refurbishment. *Rule 1: Contesters should always wait as long as possible before commencing work on their station.*

First job was the transmitter. Having experienced the pleasure of full break-in for many years before getting the Drake, I thought it was time to replace the ageing T/R relay with something more modern. I was sick of all the clattering, bouncing, and time delays inherent in "semi break-in" (a contradiction in terms if ever there was one: it's either break-in or it isn't). Besides, the relay was on its last legs. So, out it came, and in went a few transistors. What bliss, full QSK again!

Next job was the antenna, a top loaded vertical with a very slow band-switch (ie a ladder and soldering iron). To accommodate the new matching network, and eliminate the 250 ml yoghurt container used for weatherproofing, I decided a metal box was needed. Much cutting, banging, and bending later, the box was finished. (The fact it was now Friday night is beside the point, because any true contester will tell you this left plenty of time before the weekend). I still didn't have a proper matching network of course, because I had been too busy building the box, but that could easily be done the next day after lunch. *Rule 2: Even on Friday night, there's still plenty of time before a contest.*

Rising early on Saturday, it seemed timely to start building a T/R switch, since the absence of a relay from the Drake meant that the receiver had no antenna. The quickest solution appeared to be to cannibalise an old valve converter, which I had built in the 60s from an EA design. The reasons for choosing the converter were that it had a ready made 180 V DC supply, and it had never worked properly anyway. Several hours later the T/R switch was finished (a grounded grid 6C4), and wonder of wonders, it worked! This was indeed a good omen for the weekend. *Rule 3: Good omens are a very bad sign.*

The rest of the afternoon was spent climbing up and down the ladder with a soldering iron, about 15,000 times, and still not being able to get the SWR right on 40 m. By now it was dark, and as 40 m had already been open for two hours, the choice was rapidly boiling down to 80 m single band or television. The television lost. *Rule 4: In a DX contest, only lunatics decide to go barefoot on 80 m single band.*

The time to burn up the band had come! After resetting the time on my PC, I typed "CT" to start the logging program, but nothing happened. So I typed "CD CT", to which the PC responded "Invalid directory". What's this? Hmm... nothing to worry about, maybe it's on the OS/2 partition? So I rebooted, looked for the CT icon (which struck me as odd because I couldn't remember ever creating one), but of course there was no such thing. Then it dawned on me that when I had changed the hard disk a couple of months earlier, I had not reinstalled CT. Grrr!! *Rule 5: When changing your hard disk, don't wait until the contest starts to reinstall your logging program.*

Having finally started, after the third QSO there was an almighty BANG! followed by lots of smoke and a terrible smell. The dog rushed in barking, followed by my wife (or maybe the other way around, the barking that is), and in the ensuing melee I realised that the upright electrolytic on my new T/R switch had exploded, probably because it had been sitting around unused for 30 years and I had not bothered to reform the dielectric. So, after rummaging around in the garage and finding some 20 year old replacements, I spent the next half hour twiddling my thumbs waiting for them to reform. *Rule 6: Anyone who uses thirty year old electrolytics for the first time in a contest, without first reforming them, is an idiot.*

Now any seasoned DXer will tell you that on a good day, 80 m can be very rewarding. Unfortunately, this was not one of those days, and in between the crashing and banging I could just hear the JAs going "QRZ UK3?" (sic) and "SRI OM NOT CALL HRD HI HI". My peak rate was a slow 19, and in the last hour it was down to a dismal 6, so I went to bed. *Rule 7: When the going gets tough, sometimes even the tough should go to bed.*

A run of Europeans early the next morning unfortunately persuaded me to stay in the contest, so, to retain my last shreds of sanity, I decided that a rickety old linear amplifier would have to be resurrected. However, it doesn't have a power supply, and although I have used the "mad lash up under the bench" construction technique in the past, I was not keen to have to extinguish the dog, should she walk into the shack and decide to investigate the mess under the bench. Luckily, a suitable supply had been sitting half finished in the garage for the last three years, so the rest of Sunday was spent on more cutting, banging, and soldering.

By Sunday evening the power supply was finished, but by then I was totally exhausted and could not face the inevitable sparking and fuse blowing which happens when you apply power to a box full of spiders, not to mention the

trauma of changing bands (the linear is one of those unique home made contraptions where to change bands, one has to remove twenty screws to get the cover off, and then resolder the taps on the plate coil with a soldering iron). Another problem with this particular unit is that several years earlier, whilst it was sitting on the garage floor, it got sprayed by the cat during the mating season. Apart from the evil corrosion, the thing has stunk terribly ever since! It's really true, I'm not making this up. So, it was barefoot once again. *Rule 8: Don't leave your linear on the floor when the cat's on heat.*

The second night went much the same as the first, so to pass the time between QSOs (there's a joke there somewhere), I periodically had a listen to 40 m . The difference was amazing; crystal clear signals, no QRN, plenty of DX. Going back to 80 was like retreating to the cellar.

Was it fun? Does a sane person enjoy having teeth pulled? On the other hand, anyone who would subject themselves to the above is not sane, so I would have to say, yes. Like all those types who get their kicks from bungy jumping, ice climbing, running away from charging bulls, etc, there is a certain horrible appeal in battling the QRN and poor propagation on the low bands (not to mention station chaos) just to make a handful of QSOs. At the end of it, you know you have worked hard for every point, and the feeling of achievement is palpable. *The final rule: Don't give up, it's worth it in the end!*

PS I'm now working on my antenna for 160 m for next year's contest.

Thanks to VK2BQS, PA3BFM, *QST*, and *Radio Communications.* Until next month, good contesting!

73s, Peter VK3APN

Addendum to Rules for Ross Hull Memorial Contest

Please note the following correction to the date: Wed, 27 December 95 to Sat, 27 January (UTC).

In answer to a reader's query about 6 m scoring, the reference to "2 points per 1000 km or part thereof" applies only to distances *over* 1000 km. QSOs on 6 m below 1000 km retain their higher points value, eg for 900-999 km, 6 m QSOs are worth 10 points.

PACC CW/SSB DX Contest

1200z Sat to 1200z Sun, 10/11 Feb

This is a very popular European contest, with phone and CW held on the same weekend. The object is to work as many Dutch stations as possible on 160 to 10 m, excluding the "WARC" bands. Categories are single and multi-operator; SWL. Only CW contacts are eligible on 160 m. Stations may be worked only once per band, regardless of mode.

Exchange RS(T) plus serial number; Dutch stations will RS(T) plus a 2 letter province code. Possible codes are: DR FR GD GR LB NB NH OV UT FL ZH ZL. Score one point per Dutch QSO. Final score equals the total QSO points times the total Dutch provinces worked from each band (max 72). Mail logs by 31 March to Frank E van Dijk PA3BFM, Middellaan 24, NL-3721 PH Bilthoven, The Netherlands. Certificates will be awarded to the top scoring stations in each category and country, including second and third places where justified.

Spanish RTTY Contest

1600z Sat to 1600z Sun, 10/11 Feb

The object is to contact as many stations worldwide as possible, on RTTY, 80 to 10 m. Categories are single operator (single/multiband); multioperator single transmitter; SWL.

Exchange signal report and CQ zone. Spanish stations will send signal report and province. On 10/20 m score one point per QSO with stations inside your WAC continent, and two points with stations outside your WAC continent. On 40 and 80 m, the QSO points are tripled. QSOs between stations in the same country can be claimed for multiplier credit, but not QSO points. The multiplier is the sum of the DXCC countries and Spanish provinces (max 52) per band. The final score is the total QSO points times the multiplier.

Send log, summary and declaration by 8 April 1996 to EA RTTY Contest, c/o EA1MV Antonio Alcolado, PO Box 240, 09400 Aranda de Duero (Burgos), Spain.

ARRL DX Contest

CW: 0000z Sat to 2400z Sun, 17/18 Feb
SSB: 0000z Sat to 2400z Sun, 2/3 Mar

There is always plenty of activity in this popular contest. The CW section runs on the third full weekend in February each year, and the phone section on the first full weekend in March. The object is to work as many W/VE amateurs as possible on 1.8-30 MHz. Categories are single operator (single band, all band, all band QRP max 5 W O/P, and all band assisted); Multioperator (single Tx, two Txs, and unlimited). In the single and 2 Tx categories, once a transmitter has begun operation on a band it must remain on that band for at least 10 minutes. Listening time counts as operating time.

Exchange RS(T) and a three digit number indicating approx output power. W/VE stations will send RS(T) and state/province. Score three points per W/VE QSO. The multiplier is the sum of US states and District of Columbia (DC) (except KH6/KL7), NB (VE1), NS (VE1), PEI (VE1 or VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), and LAB (VO2) worked to a maximum of 63 per band. The final score equals the total QSO points times the multiplier.

Entries with more than 500 QSOs must include cross-check (dupe) sheets. Logs on DOS disk are welcome in lieu of a paper log, providing a paper summary sheet showing usual info is included. Multioperator entries must list all operators. Entries must be postmarked by 7 April 1996 or they will be classed as check-logs (no exceptions)! Mark the envelope CW or Phone, and send the log to ARRL Contest Branch, 225 Main Street, Newington, CT 06111, USA. Certificates will be awarded to the top scoring stations in each country and category, and plaques to the top worldwide and continental stations.

RSGB 7 MHz CW Contest

1500z Sat to 0900z Sun, 24/25 Feb

The object of this contest is to contact as many British Isles stations as possible on 40 m CW. Exchange RST plus serial number starting at 001; UK stations will add their county code. Oceania stations score 30 points per QSO, and the final score is the total QSO points times the number of UK countries worked. Include a summary sheet showing all standard details, plus a check-list if more than 80 QSOs are made. Send logs to arrive by 15 April 1996 to RSGB HF Contests Committee, c/o S V Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF, England. Airmail is recommended, as late logs may be treated as check-logs. Certificates will be awarded to the leading entrants in each overseas section.

RESULTS OF 1995 ANARTS WW RTTY CONTEST

Presented by Jim VK2BQS (ANARTS Contest Manager)

The number of logs was about the same as for 1994. More significantly though, except for last year's Class A winner (who was visited by a storm at a vital time), the points scored by all "world place-getters" were very much increased, a trend which continued well down the listings.

Once again, eighteen VKs were recorded during the contest, of which only five submitted logs. This lack of VK participation is often commented upon by overseas entrants.

Several logs arrived after the due date, due to very slow mail from certain parts of the world. Since they were posted well before the due date and submitted in good faith, to avoid undue penalty to the entrants concerned they are included in the results below. This means there may

be minor differences between this list, and the results sheets sent out recently. No entrant has been disadvantaged, however.

As I have said before, please read the rules. I found errors such as zones being claimed as multipliers; countries being counted once overall instead of once per band; one's own country claimed as a multiplier but not QSO points for one's own country.

Anyway, thanks to all who entered, and see you next year!

Entrants' comments: Lost the driven element on my 20 m Yagi in a storm on Sunday night, little success with vertical so gave up!! *(From Contest Manager VK2KM !!!!!)*... Contest very nice with good condx on 15 m *(DL7UVO/P)*... My first RTTY contest *(YO5AY)*... Enjoyed this contest very much *(ONL3997)*... Thank you for running another nice contest *(OH2LU)*... 73 & QRO to all hams/SWL in Australia *(ONL383)*... I enjoy working contest every time *(JA3BSH)*... Propagation no good but much band activity *(ONL4335)*... Had a great time in ANARTS this year *(AB5KD)*... Very nice contest, 73/88 *(IV3FSG)*... A pity more Euros do not listen harder for W6 *(W6/G0AZT)* (My word yes!!! VK2BQS)... It is always my pleasure to take part in the ANARTS contest which I enjoy very much *(JA3DLE/1)*.

Contest Manager's Comments: Despite our best efforts to distribute the rules and points table, many entrants still had problems obtaining correct versions. Some logs were submitted as check-logs, or incorrectly scored or just not scored at all. In every case except one, there was enough information to score the log as if it was a full contest entry, so there are some of you who will be surprised to find their entry shown in full. Others will have much greater scores than expected.

The results show more detail than is usual with contests, but this is to give you a chance to see how your efforts compare with those of other contestants, to help you plan your attack next year. We feel this is a real WW DX contest, and the highest scores go to those who work the most, and the furthest.

Thank you all for participating, and hope to see you 1996.

1995 ANARTS WW RTTY Contest Results

Section A (Single Operator):

Pos.	Call	Score	QSOs	Pts	Mult	Cont	VK Bonus	
1	UT7I	3,584,870	392	5193	115	6	1700	1st UT; 1st Class A#
2	VK2KM	3,550,230	190	7305	81	6	n/a	1st VK2; 2nd World*
3	UN5PR	2,695,350	248	3775	119	6	1800	1st UN; 3rd World*
4	OH2LU	2,372,420	297	3764	105	6	1100	1st OH*
5	JR5JAQ	1,379,155	159	4113	67	5	1300	1st JA5*
6	AB5KD	1,339,476	381	3234	69	6	600	1st W5*
7	I2HWI	1,160,910	236	2697	86	5	1200	1st I*
8	G5LP	1,100,198	215	1889	97	6	900	1st G*
9	SM5FUG	1,093,560	239	2768	79	5	200	1st SM*
10	IV3FSG	910,640	95	2167	84	5	500	2nd I*
11	PS2A	717,940	126	2991	40	6	100	1st PP*
12	W6/G0AZT	493,084	131	1784	46	6	700	1st W6*
13	SP3EJJ	479,960	113	1546	62	5	700	1st SP*
14	VK5AI	297,924	62	2013	37	4	n/a	1st VK5*
15	SP3BGD	262,732	110	1041	42	6	400	2nd SP*
16	OH0/DL5FF	231,663	208	1643	29	3	—	1st OH0*
17	K2PS	197,695	86	1067	37	5	300	1st W2*
18	ER3ED	186,320	134	846	55	4	200	1st ER*
19	DL9GGA	181,760	88	636	57	5	500	1st DL*
20	VE8NC	150,540	51	939	32	5	300	1st VE8*
21	JH7QXJ	147,880	54	1115	33	4	700	1st JH7*
22	SP3FAR	145,268	48	754	32	6	500	3rd SP*
23	3Z0RY	122,120	67	710	43	4	—	4th SP*
24	N1RCT	116,400	111	970	30	4	—	1st W1*
25	ZL2JON	103,036	33	959	26	4	3300	1st ZL*
26	IK1TWC	98,418	96	1047	47	2	—	3rd I*
27	GW4KHQ	86,592	73	492	44	4	—	1st GW*
28	RS0F	81,484	44	699	29	4	400	1st RS0*
29	W2JGR	78,184	72	723	27	4	100	1st W0*
30	DK7FP/P	71,280	53	495	36	4	—	2nd DL*
31	JA3BSH	57,892	28	602	24	4	100	1st JA3*
32	SP9RTF	57,456	78	342	42	4	—	—
33	W9FFQ	56,980	48	474	24	5	100	1st W9*
34	N2LEB	53,020	31	441	20	6	100	2nd W2*
35	YO5AY	51,300	45	400	32	4	100	1st YO*
36	DJ2YE	51,060	55	345	37	4	—	3rd DL*
37	DL9MBZ	49,840	79	412	40	3	200	—
38	SP2EIW	47,235	78	335	47	3	—	5th SP*
39	LA7AJ	43,440	32	394	22	5	100	1st LA*
40	SP2UUU	39,680	46	310	32	4	—	—
41	JA3DLE/1	37,512	22	583	16	4	200	1st JA1*
42	DF5BX	26,544	35	237	28	4	—	—
43	YL2KF	9,650	39	193	25	2	—	1st YL*
44	SP8FHJ	7,560	32	180	21	2	—	—
45	VK8HA	3,738	7	178	7	3	n/a	1st VK8*

Check-log VK2GQC.

Section B (Multioperator Single Transmitter):

1	VK6GOM	2,313,510	154	5755	67	6	n/a	1st VK6; 1st Cl. B#
2	IK2SGF	926,225	225	2405	77	5	300	1st I; 2nd World*
3	VE3FJB	357,988	152	1419	42	6	400	1st VE3; 3rd World*
4	DL7UVO/P	149,155	77	633	47	5	400	1st DL*

Section C (SWL):

1	ONL383	567,720	191	1436	79	5	500	1st ON; 1st Cl C#
2	ONL4335	328,760	132	888	74	5	200	2nd ON; 2nd World
3	SM03762	232,568	121	1236	47	4	200	1st SM; 3rd World
4	ONL3997	146,400	83	584	50	5	200	3rd ON

= Plaque winner
* = Certificate winner

Results of 1995 Commonwealth Contest

Presented by John Tutton VK3ZC

It would have been a toss-up if conditions over here during the 1995 contest were better or worse than in 1994, but to give up with four hours still to go must surely indicate something.

However, a good sign was that VK log entries (multi and single band) improved from 17 and 5 to 22 and 6. If conditions in March are anything like in the recent CW WW, and they could be, look out for a bumper year in 1996.

The winner for VK was again Barry Simpson VK2BJ who continued his march towards the top, in second place to VE3EJ and with a score increase of 408 over last year. Many thanks to Russ Coleston VK4XA who operated VI4WIA as the local HQ station.

It was good to see a ZS call, ZS6ME, back in the results, the first since 1962. A couple of months ago at the CHOGM held in New Zealand, Cameroon and Mozambique were elected to membership of the Commonwealth, so we may see activity and perhaps expeditions to these outposts in the future.

RSGB Comments from G2HLU

Opinion is about equally divided over whether conditions were better or worse than in 1994 or about the same; they were certainly not good! More than one entrant commented on the similarity to 1985; and G2QT noted optimistically that 1986 was better. At least the number of entries was gratifyingly up on last year; but regrettably, for the third year running, no one entered the Receiving Section.

The winner, not for the first time, is John Sluymer VE3EJ, who contacted a total of 487 stations from his aerial farm (which includes a three element beam for 40 m at 150 feet), fed with 1 kW. Close on his heels came Barry Simpson VK2BJ who used a modest 100 W to a choice selection of lower sky-wires. Usually among the leaders, Nigel Hoyow 6Y5HN used a TS-120S/SB-201 combination and various antennas at 50-55 ft to come third, from his 2000 ft high QTH, and with the advantage of being able to work strings of G stations (though not on 15 or 10 m) just managed to out-distance Dave Lawley GB4UO to whom the Col Thomas Rose Bowl returns after a few years' lapse. The winner of the G3PJT medal, introduced last year, is Ivor Stafford VK3XB, whose rise from 77th to 32nd place in the last four years has been done with very restricted indoor antennas, at the bottom of the sunspot cycle.

The total number of participants (over 630) was about the same as in 1994 but there were twice as many on 15 and 10 m. Nearly 60 call areas were active (25 produced entries): C5, G (including GD, GI, GJ, GM, GU, GW), GB (HQ), S7, VE1, 2, 3, 4, 5, 6, 7, 9, VE3 (HQ), VK1, 2, 3, 4, 5, 6, 7, 8, 9N, VK4 (HQ), VO1, VP2E, VQ9, VR2/VS6, VU, VY2, Z2, ZB2, /ZL, ZL1, 2, 3, 4, 9, ZS1, 4, 5, 6, 9, 3B8, 3DA, 4S, 5B, 5X, 5Z, 6Y, 7P, 8P, 9H, 9J, 9L, 9M2, 9V1 and 9Y4. About 14% of G stations who were active sent in logs, and the same percentage of VEs, but VKs excelled with 44% of participants entering. Some entrants/call areas were notably absent, but the re-appearance of ZS stations was very welcome and we must hope that the log from ZS6ME will be the precursor of a wider entry from South Africa next year. The entry of Bill Maxson is noteworthy: he operated as G0/N4AR using the station of the late and much lamented Al Slater G3FXB; he could not be expected to match the performance of that master.

Some comments received with logs: "Conditions must get better" GW3HGJ; "Certainly enjoyed my first BERU contest" ZS6ME; "Good family feeling, familiar calls year after year" ZL4OK; "Where has the Commonwealth gone? — only worked seven countries" VK2AYD; "VEs and VKs did a great job" ZL1MH; "I believe that I may have been the only XL operator to have sent in a log regularly" VK3KS; "All G stations worked (15 m) on backscatter!" 9H1EL; "Fewer prefixes, many missing" G3BPM; "Hard work with wire antennas in sunspot minimum" G4KDL; "Anyone who got 599 from me really was S9 — and there weren't very many" VE3VHB; "Still the best of the HF contests" ZL1HV; "Looking forward to BERU again next year!" VE3HX

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse side of the *Amateur Radio* address flysheet.

1995 Commonwealth Contest Results

Top Ten

Position	Call	80	40	20	15	10	Total
1	VE3EJ	832	1405	2167	677	50	5131
2	VK2BJ	663	1709	1700	768	248	4998
3	6Y5HN	585	1089	1639	480	175	3968
4	G4BUO	618	1151	1577	450	100	3896
5	ZL4OK	530	1259	1027	537	300	3653
6	ZL1MH	450	952	1075	677	285	3439
7	9J2BO	277	849	1184	833	262	3405
8	VK4EMM	380	1285	993	508	223	3389
9	G0IVZ	453	1039	1250	300	50	3092
10	G4ODV	352	885	1411	275	50	2973

Australian Scores

Multi-Band

2	VK2BJ	832	1405	2167	677	50	5131
8	VK4EMM	380	1285	993	508	223	3389
11	VK2AYD	315	807	1251	438	150	2961
18	VK2BQQ	332	1069	737	198		2336
20	VK4ICU	270	530	845	400		2045
23	VK4XW	263	633	887	200	25	2008
26	VK2EL	50	892	824	125	50	1941
31	VK3ZC	320	618	592	123		1653
32	VK3XB	48	557	796	250		1651
33	VK5AGX	200	341	1078			1619
36	VK4OD	245	532	692	25		1494
37	VK4BQL	215	453	670	125	25	1488
38	VK2DID	130	425	728	198		1481
43	VK4LV	100	254	684	147	123	1308
47	VK8HA	105	598	525	25		1253
53	VK4UR			645	173	168	986
56	VK3AGW	25	403	450	25	50	953
69	VK3KS		90	587			677
75	VK3IY	268	233				501
80	VK3AMD			255			255

Single-Band

7 MHz

1	VK2AOK	1913
2	VK2ETM	1010

14 MHz

3	VK4TT	1142
4	VK3MR	1078
6	VK6AJ	848
7	VK2VM	754

The 1996 Commonwealth Contest will take place on 9 and 10 March 1996, and the rules will appear in the February 1996 issue of *Amateur Radio* magazine.

*PO Box 2175, Caulfield Junction, VIC 3175

Divisional Notes

Forward Bias — VK1 Notes

Peter Parker VK1PK

It's Ours! RD Trophy Comes to Canberra!

All VK1s were pleased to read in November's *Amateur Radio* that, for the first time for many years, the VK1 Division had won the Remembrance Day Contest. The win follows a concerted publicity campaign and was only made possible by the support of local amateurs. The number of logs submitted by VK1s more than doubled, and the average score per log rose substantially compared to the previous year. The victory breaks the stranglehold that the VK3 Division had over the trophy in recent years. The Division would particularly like to thank the RD Contest Manager, Alek VK6APK, for bringing us the results in record time, and commiserate the VK3s for their loss.

Divisional AGM Next Month

Have your chance to make your mark on amateur radio in the ACT by volunteering to be on the VK1 Divisional Committee. All positions will be declared vacant, and members are invited to nominate for them. In particular, we need a new Treasurer, as Alex VK1AC will be retiring. The AGM is to be held on Monday, 26 February in the Griffin Centre.

Rally Successful

Local amateurs tested their communication and message handling skills during November's Canberra Rally. By all accounts, the event was a success and a credit to those who took part.

Newsbriefs

Approximately 20 people attended the Division's Christmas Barbecue, held at Weston Park, Yarralumla. While it was cold and bleak, the rain held off, and those who attended enjoyed themselves.

The recent improvement in VK1WI's audio quality is due to the efforts of the VK1 Repeater Committee, who provided a refurbished FM828 and microphone.

Canberra Citizens Access Television Association is looking for volunteers to be involved in establishing a community TV station in Canberra. If you are interested in helping, please phone Nita Vartuli on 231 4452.

Nominations are called for in time for next month's AGM — see above.

The Internet edition of VK1WI Amateur Radio News is now available in Canberra local libraries through the Community Information Network. Find it on the aus.radio.amateur.misc newsgroup.

VK1 Committee meetings are now held on the second Thursday of the month. This means that the next committee meeting will be on January 11.

VK2 Notes

Richard Murnane VK2SKY

WIA on the WWW

In the last few months there has been a dramatic increase in the level of activity on the Internet, fuelled largely by a fairly recent innovation called the World Wide Web (WWW). Designed as a research tool several years ago, the Web is a mechanism for finding information from computer sites all over the world and presenting it in a "user friendly" manner. The information is multimedia, ie it can take any form, such as text, graphics, animation, sound, etc, so it goes far beyond what we experience with our packet radio network.

Not wanting to be left out, the NSW Division now has its own World Wide Web page, which contains useful information about the WIA, and about amateur radio in New South Wales, for example:

- WIA Member Services
- VK2WI Broadcast schedules and bulletin archives
- Coming Events list (up to a year ahead)
- Affiliated Clubs and Amateur Examiners list (see below)
- The Internet Australian Amateur Radio Frequently Asked Questions (and answers, of course!)
- "Hot links" to the Web pages of the SMA, and IPS Radio and Space Services, and to over 300 other Amateur Web sites worldwide.

The URL (Universal Resource Locator) for the WIA (NSW Division) Web page is: http://sydney.dialix.oz.au/~wiansw.

If you forget the URL, don't worry; you can find it with a Web search, using the key phrase "Wireless Institute", or simply "Amateur Radio".

Because the Divisional Web page is accessible from virtually anywhere on the planet, I have also included information for overseas amateurs who intend to visit Australia, and links to other Web pages detailing some of the attractions around Sydney and New South Wales.

The Divisional Web page is constantly evolving, so I'm always happy to hear suggestions for making it more useful.

Web Page: Be On It

As mentioned above, the Divisional Web page features a list of affiliated clubs and amateur examiners. We are asking all affiliated clubs to submit up-to-date details for inclusion in the list. Many potential radio amateurs (and therefore club members) are on the Internet, so this is your chance to reach them.

Please note that clubs that do not submit details *will not be included* in the list. Much of the club information held at the Divisional Office is sadly out of date, and I have no wish to propagate inaccurate data on the net. Send your club details by Internet e-mail to wiansw@sydney.dialix.oz.au, or mail or fax them to the Divisional office.

Club details should include the club location, meeting times, postal/phone/packet/e-mail contacts, plus local repeater data, club nets, and examination details if applicable. If your club specialises in a particular area of amateur radio, please note that as well. If your club has its own Web page, just send the URL and you will be linked in straight away.

Are You Confused Yet?

My apologies if all the Internet jargon has left you in a daze. Let me assure you that it all looks better than it sounds! By the time you read this, I should have completed an article for *Amateur Radio* magazine that will explain the World Wide Web for Radio Amateurs. Even if you don't own a computer, the Web may be closer than you think, as the pay TV companies may soon be offering Web access via your television set. Stay tuned...

Thought for the Month

"I could never make out what those damned dots meant" -- Winston Churchill (speaking about decimal points)

VK6 Notes

John R Morgan VK6NT

November General Meeting

About thirty members attended the last GM of the year, at which almost two hours of varied business was discussed and decided.

The decline in the attendance at the monthly meetings has caused the members of Council to question whether these should continue. At the January GM there will be a discussion on the matter, to determine the members' views. The ramifications for the QSL Bureau and the Bookshop will have to be considered. The President requests that members make a special effort to be present, and to participate.

The VK6 Division meets on the third Tuesday of each month, at the Westrail Centre, East Perth, commencing at 8 pm. The bookshop and QSL bureau open at 7 pm. All interested persons (members and non-members, licensed or listener) are encouraged to attend. Free coffee and biscuits are available at "half time".

Re-Broadcast of VK3OTN

The Radio Amateurs Old Timers Club (RAOTC) is a nation-wide club for those who have held an amateur licence, or its equivalent, for more than 25 years.

Their VK3OTN broadcast occurs on the first Monday of each month, except January, and is beamed to VK6 on 14.150 MHz at 0200 UTC. Unfortunately, even though there are about 50 members of the RAOTC resident in VK6, it is rare for more than three to call-back after the broadcast.

Clem VK6CW was recently approached by the RAOTC to help increase the local availability of the broadcasts, especially to those members who are residents of "retirement villages" and similar accommodation (where HF antennas are prohibited), and those without packet or RTTY.

In order to accomplish this, Clem has applied for permission to re-transmit VK3OTN's 20 m signal on WARG's network of VHF/UHF voice repeaters in the south-west of VK6. Initially, he intends to conduct three experimental relays of the February, March, and April broadcasts, before assessing the usefulness of the arrangement.

Members of RAOTC in VK6 are advised to listen to the VK6WIA news broadcasts in late January for up-to-date information.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" — News from the Tasmanian Division

Robin L Harwood VK7RH

A new calendar year has started and your Division is at present winding up the affairs of 1995, preparatory to the Annual General Meeting, which will be held on 23 March. The venue will be the Domain Activity Centre and is timed to commence at 1400 hours Eastern Daylight Time.

All Annual Reports should be forwarded to the Divisional Secretary by 22 February at the address given in the Divisional Directory on page three of this issue of *Amateur Radio*. Nomination forms for Divisional Council will be forwarded to each Branch by the February meeting, and can also be obtained by writing to the Divisional Secretary. Nominations can only be accepted from current financial members of this Division and those proposing and seconding the nomination must also be current financial members. Nominations close on Friday, 22 February 1995 with the Divisional Secretary who is also returning officer. If there are more candidates than vacant positions, an election will be necessary and ballot papers will be forwarded ten days prior to the AGM to all current financial members.

Notices of Motion should also be forwarded by 22 February and the proposer and seconder again must be current members. I believe that several Notices of Motion will be tabled by our Honorary Solicitor to tidy up the Divisional Constitution.

Next month will see the various Branch Annual General Meetings held and officers elected. The dates are of these are: Southern Branch, 7 February at 8 pm at the Domain Activity Centre; Northwestern Branch, 13 February at 7.45 pm at a venue to be advised; and Northern Branch, 14 February at 7.30 pm at St Patrick's College Staff Common Room, Mt Leslie Road, Prospect.

Please note that the Northern Branch will be holding their January meeting one week later than normal on Wednesday, 17 January, again at St Patrick's College, Mount Leslie Road, Prospect at 7.30 pm. The Northwestern Branch may be holding a monthly meeting so please check the weekly VK7WI broadcast early in January. The Domain Activity Centre will be open on Wednesdays from 12 to 5 pm during January.

BR

How's DX

*Stephen Pall VK2PS**

And a Happy New Year to you all! Hopefully your wishes to have a contact with the DX station you have been awaiting for many years, will come true; you will have a good contact and a few months later the postman will bring you the magic confirmation, the highly prized QSL card.

A result of a survey conducted mid-year in 1995 by The *DX Bulletin* showed that the most wanted DXCC country in the world is Bhutan. 65.5% of DXers need it. Second place goes to the Andaman Islands with 63.4% and, in third place is Heard Island with 60.8%.

Those who had hoped by now they could have crossed off Heard Island from their own personal most wanted list, must wait patiently for another twelve months.

Details of the transportation debacle which overtook the Heard Island DXpedition are now well known. DXpeditions to inaccessible, uninhabited island countries such as Bouvet 3Y, Peter I Island 3Y, South Sandwich Island VP8S, and Heard Island VK0 are very costly affairs running into many hundreds of thousands of dollars. A very big slice of the expenses represent transportation costs. Chartering vessels from 20,000 km distance is not an easy task. In organising a major DXpedition, secrecy and not publishing details in advance is very important to prevent opposition groups from securing the necessary funding from commercial sponsors and DX Foundations. Sponsors support only the group which has a good track record and which is likely to succeed. "In this game of DXpeditions", said one of the Heard Island DXpedition group, "to come second is equal with zero". This secrecy on the part of the organisers can cause havoc sometimes, as happened in this case.

It has to be said quite plainly. The organisers from overseas fully trusted a very unethical, to use a polite word, Australian businessman and they have fallen victim to the "attractive" deal offered by him. That this happened to our friends from across the Pacific is our national shame.

The lesson for the future is simple. When one cannot buy a return airline ticket to the final destination, when one has to charter a boat for transport, and when one is willing to spend a great amount of money for such a journey, one needs a person with very good commercial and business experience, a person who is local, who can deal with the other party face to face, and who is able to sort out the good from the bad.

Heard Island — VK0

Ralph Fedor K0IR, the organiser of the Heard Island DXpedition, released the following message on 15 November 1995: *"Dear Fellow DXers,*

I arrived home from Western Australia late last night. As most of you are aware, the Heard Island DXpedition team ran into

difficulty in Australia. As a result, we must postpone the DXpedition.

Upon arriving in Australia, the advance team of ON6TT and PA3DUU found our charter vessel, the Tallarook, unsuitable for a voyage into the Southern Ocean. The owner/operator of the Tallarook, a Mr Kris Mitchell of K & DM Transportation, misrepresented his vessel in the contract and did not outfit the vessel as we had specified. He fled under the cover of darkness with the team's down payment.

Investigations into Mr Mitchell's credibility revealed no problems prior to these incidents. Legal limitation on information that can be released shielded Mr Mitchell from thorough scrutiny during our initial contract with him.

Legal counsel in Australia tells us our chance of recovering our own payment is essentially zero. We have, however, contacted the police, the Attorney General of Australia, The Minister of Tourism and other Australian government officials. Although our loss seems unrecoverable, perhaps our action will shield other visitors from Mr Mitchell. Save for our contact with Mr Mitchell, the Australian people and the Australian amateur community have been gracious hosts and saddened by our misfortune.

Our team at first considered a hurried re-organisation and a trip to Heard Island in January of 1996. Securing a ship on such short notice and rearranging our personal schedules has proven unrealistic. We are, therefore, planning a one year delay in the operation.

The losses resulting from our encounter with Mr Mitchell are substantial. They exceed $100,000. However, no contributions sent to The Heard Island Expedition, PO Box 163, Waite Park, MN 56387 have been spent. Cheques have not been cashed. Contributions will be returned to those who sent them. In addition, funds from the NCDXF and INDEXA remain untouched. From the beginning I made it clear that the risks of this DXpedition would be borne by the team members. Acceptance of those risks was a prerequisite for becoming a member of the Heard Island team. The same was true of the 3Y0PI team. Painful as it is, the Heard Island team members will honour that commitment and be responsible for the loss.

While we regret what has happened, we are fortunate in that we did not let the emotion of the moment control our actions and board a vessel that was unsafe. We are all alive and well and anxious to get on with our commitments, albeit a year later, Undoubtedly there will be changes, but the team's consensus is to carry on.

I have doubts that my schedule will allow me to participate in an expedition a year from now. Therefore, I have asked KK6EK and ON6TT to assume the leadership role in developing future plans. Thanks to all of you who supported us and encouraged us."

In a news item in the *"425 DX News"* of 26 November there are some new prominent points made in connection with the re-start of the expedition. These are:

1. Safety to be the determining factor.
2. The team will be expanded, perhaps to 20, although not all will be radio amateurs.
3. The budget will have to be increased.
4. The principal radio goal will be to get everybody in the log.
5. The management and progress of the project will be much more public and your input and participation will be most welcome.

The group is looking for a semi-professional public relations person to interface with the media and seek support through media contacts. They need an Internet communication person and they will try to find a professional film or video person to do a documentary for international markets (that person will have to find his own support).

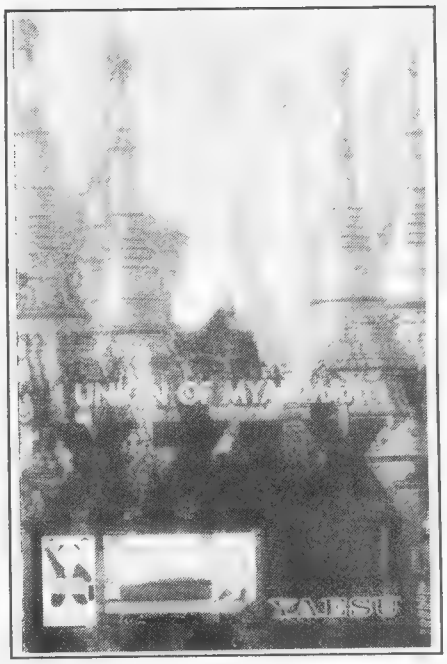
Finally, here are some interesting extracts from an article written by Bruce Butler in the West Australian *"Sunday Times"* of 12 November 1995 on page four, which apparently is based on a discussion which Mr Butler had with the leader of the expedition, Ralph Fedor (because of space limitations, I can quote to you only parts of the article).

The article is headed "Boat Deal sinks Antarctic Quest"

"An international Antarctic expedition which was to start in Fremantle has been scuppered, with organisers $AUS160,000 out-of-pocket. After sending the money from the US to a Melbourne based company, expedition leader Ralph Fedor, a Minnesota doctor, expected to find a 25 m vessel, the "Tallarook", waiting in Fremantle. Instead, the vessel, allegedly riddled with wood rot, was still undergoing repairs in Cairns, northern Queensland.

It has since been revealed that the company, headed by Kris Mitchell and his wife Dani, was under investigation by Victorian police over another proposed voyage to the Antarctic.

Dr Fedor had negotiated a contract with Mr Mitchell, of K & DM Transport Pty Ltd, which trades as Pioneer Cruises of Glenroy, Victoria and paid four instalments of $40,000 each. The last payment of $33,000 was due when the expedition reached Heard Island, an Australian territory 4000 km south of Fremantle. Dr Fedor fears he has lost all the money and is left with little hope of salvaging the expedition.



The Golden Land — Myanmar.

Mr Mitchell could not be reached by the Sunday Times and Victorian police have been unable to contact him. The Tallarook was to have been equipped in Cairns and called at Sydney and Melbourne before arriving in Perth by mid-October. Instead, it left Cairns early on one morning, allegedly to escape creditors of K & DM Transport. Several hours later the boat limped into Bowen, a small port between Cairns and Rockhampton, taking water.

"The Tallarook was billed as seaworthy and adequate for the trip", a dejected Dr Fedor said in Perth this week. "It turned out to be a wooden vessel, which we had some concerns about, and some people said there were worm holes through two thirds of the outer hull. We were not allowed on the vessel itself but we learnt the desalinator and the electric generator were not working. The vessel was supposed to be on site (Fremantle) from 15 October but, at that stage, it was still in Cairns. On Wednesday I heard the vessel had come ashore and another creditor had put it under arrest".

Though he never met Mr Mitchell, Dr Fedor said he believed what he was being told. "I spoke to him numerous times over the phone and we have exchanged lots of faxes", Dr Fedor said.

Dr Fedor said when two of the expedition members came to Australia and saw the boat, his concerns were confirmed."

This is the end of extracts from the quoted article in the *Sunday Times*.

Macquarie Island — VK0WH

Macquarie Island lies in the southern Pacific Ocean, nearly 1450 km south-east

of Tasmania, and midway between New Zealand and the Antarctic continent (Lat 54° 30' S, Long 158° 57' E).

The island is a narrow ridge 37 km long and five km wide. Macquarie Island is a nature reserve and forms part of the State of Tasmania. It has a plateau that rises sharply to 305 metres above sea level, rising in places to low rounded spurs and hills, many in the 300-400 metre range. The highest peak is Mt Hamilton reaching 433 metres. The edge of the plateau falls away abruptly to the sea or to narrow beaches.

The climate, flora and fauna are typically sub-antarctic with a mean temperature of 5° C. There is little sunshine, and mist, rain and snow are common. Strong westerly winds are a feature of the climate. There are no trees on the island but luxuriant vegetation covers the plateau slopes and coastal flats.

Macquarie Island was discovered in 1810 by Frederick Hasselburg (a name that is variously rendered Hasselborough, Hasselbourgh and Hasselberg) an Australian sealer who named it after Lachlan Macquarie, the then Governor of New South Wales. For a number of years it was visited by Australian and New Zealand sealers. By the middle of the 1830s the fur seals on the island had been exterminated and the numbers of elephant seal were greatly reduced, though intermittent sealing continued until 1919.

Thousands of penguins and albatrosses breed on the island and, for some years after 1907, penguins were slaughtered in large numbers and were then boiled down for the sake of their oil. This industry, however, was stopped as a result of public outcry.

In November 1930 the BANZAR Expedition ship "Discovery" made magnetic determinations and zoological observations, the last recorded visit to the island until the Australian National Antarctic Research Expedition established a permanent research station there in 1948. The ANARE station on the island has been operated continuously since its establishment and carries out research into various sciences, including meteorology and upper atmosphere physics, geology, geophysics, biology and cosmic ray physics.

Amateur radio was represented on the island by a variety of scientists and technical personnel who had an amateur radio licence. One has to think of Graeme VK0GC who was active from the island in the years of 1983 — 1985, 1987 and 1989. Sjoerd "Sojo" VK0SJ operated from there in 1986, Doug in July 1987 as VK0DS. Robyn, a YL operator, was active (both SSB and CW)in 1989. The last activity from the island was early in 1991 by Mark VK0ML. Incidentally, the ANARE station has been built on the site of Mawson's camp in the shadow of "Wireless Hill" on a narrow land-neck about 100 metres wide called "The Isthmus". In 1911, the famous Australian polar explorer Douglas Mawson built a radio station on the island as a relay station for his Antarctic expedition.

Macquarie Island ranks in sixth place on the most wanted country list according to the survey conducted by *The DX Bulletin.* 48% of the DXers who replied to the survey indicated that they need this country for DXCC.

The difficulty of operating from the island is that it is a nature, fauna and flora reserve under the full control of the Tasmanian Parks and Wildlife Service which does not allow access to the island, except for a maximum of 48 hours on a nominated date by the service.

The maximum number of visitors is 500 per annum, most of whom are fare paying tourists who are allowed to go ashore during the daylight hours only, and must return to the offshore anchored ship for the night. Nothing can be brought onto the island whatsoever and, naturally, no equipment of any description. Of course, no activity of any description can be carried out from the island which includes amateur radio. The ANARE station has special permission to occupy the site because it carries out scientific research work.

In past years there were numerous attempts by a number of amateurs, among them two from the Sydney region who negotiated for almost two years without result to get permission to land on the island. The relevant authorities were not willing to allow any group of people on the island for a period of 10-14 days. The reason given was possible ecological damage and hindering the research program.

So it is with great joy, after checking with the Hobart office of the ANARE, I can report to you that Warren Hull, one of the new ANARE personnel for the year 1996, has an amateur licence and hopefully is already active as VK0WH from Macquarie Island.

Further details about modes, frequencies and QSL route will be published as soon as it is available. Incidentally, Graham VK0GC is also in Antarctica on Davis Base.

Dawn ZL2AGX — the well known YL DXer.

Future DX Activity

- Thomas DL9FCQ will be active from QATAR from 29 December 1995 to 14 January 1996 as A71AN/DL9FCQ. He will QSL only this activity via Tom, Box 1139, 63590 Hasselroth, Germany.
- Martii OH2BH reports that preparations for a North Korea activity as P5BH and P5XX are continuing and there will soon be an official announcement.
- From 12 December 1995 until 1 April 1996, F5UJQ will be active from the Ivory Coast as TU4DA, on SSB on 10 to 40 metres. QSL to F5LPL, 27 SQ Duformentelle, F-94700, Maisons Alfort, France.
- Gary E Neill, who operated from the Central African Republic as TL8NG, will be active from Albania for at least one year as ZA1NG. QSL to WA1ECA.
- Ezio IK4BDZ is active from Lesotho as 7P8EZ on all bands on CW and SSB. QSL to I4JEE.
- CE9AP is active from the Chilean Antarctic base, Capitan Arturo Prat,

located on Greenwich Island in the South Shetlands. QSL via CE2LOL.

- Paul 9L1PG will soon return from his stateside vacation with a new rig and amplifier to Freetown, Sierra Leone.
- Ralf DL2FDK will be active as HS0/DL2FDK from Bangkok until 12 January. QSL to home call.
- YO9CWY/D2 is a new station of the Romanian UN forces in Angola and will be active on all bands for the next few months. Valery D2/YO3YZ closed down at the end of December last.
- Bill Kennamer K5FUV of the DXCC Desk has confirmed once again that all activities of authorised guest operators at the station of 3V8BB (natives and foreigners) are accepted for DXCC.
- Eric WZ6C, previously in Bangladesh, is active from Guyana as 8R1ZG.
- Darek TJ1GD is a young Catholic priest who is now in Cameroon. He is looking for the donation of a matchbox tuner and an amplifier. Write to Darek Gosawa, PO Box 40, Bertoua, Cameroon, Africa if you are able to help. Presently he is active with an FT-840 and a beam on 20 metres. QSL to SP9CLQ, Andrzej Eluja, u1 Aleksandry 9/25, 30-887, Krakow, Poland.
- Chris W1EH will be in Malawi for three years working for the US State Department, and hopes to have a licence soon. Chris has little equipment and works mainly on CW.

Interesting QSOs and QSL Information

- 3W5FM — Nikolay — 14195 — SSB — 1334 — Oct. QSL to The Manager, POB 66, Vladimir, 600011, Russia.
- A61AN — Naser — 14227 — SSB — 1334 — Oct. QSL to Naser Fekri, PO Box 53656, Dubai, United Arab Emirates.
- 9K2MU — Murtada — 14118 — SSB — 0400 — Oct. QSL to WA4JTK, Alan E Strauss, 17401 NW 47th Ave, Carol City, FL 33055, USA.
- VK4ALF/VK9M — Steve — 14195 — SSB — 0410 — Oct. QSL to AA6BB, Gerald D Branson, 93787 Dorsey Lane, Junction City, OR 97448, USA
- J37LF — Thor — 14222 — SSB — O642 — Oct. QSL to The Manager, POB 117, St Georges, Grenada, West Indies.
- Z31ET — Tod — 14222 — SSB — 0600 — Oct. QSL to The Manager, POB 44, Kocani 92300, Macedonia.
- KH0AM — Tack — 21311 — SSB — 0408 — Oct. QSL to JE1CKA, Tack Kumagai, POB 22, Mitaka Tokyo, 181, Japan.
- JT1Z — 21317 — SSB — 0425 — Oct. QSL to K6VNX, Arient T Turiff, 8819E Callita St, San Gabriel, CA 91775.
- VK9FN — Siegfried — 10.102 — CW — 0551 — Nov. QSL to DK9FN via the Bureau only. No direct cards.
- 9M6NA — Saty — 14017 — CW — 0414 — Nov. QSL to JE1JKL, Saty Nakamura, 1-27-2, Kamiya, Ushiku, Ibaraki 300-12, Japan.
- ZL7CW — Jon — 14011 — CW — 0352 — Nov. QSL to WB8YJF, Jon E Severt, 5586 Babbitt Rd, New Albany, 43054 USA.
- J88BW — Bill — 14226 — SSB — 1306 — Nov. QSL to William DeFreitas, POB 206, Kingston, St Vincent, West Indies.

Remember to leave a three second break between overs whjen using a repeater.

From Here and There and Everywhere

- Lothar T32ZB spent, altogether, 34 days on Christmas Island (Kiribati). He is 59 years old, a retiree living in Berlin as DJ4ZB. He suggests QSLing via the Bureau (DARC) as this makes QSLing more inexpensive. If you must QSL direct, then please include one IRC and one "green stamp" as postage is very expensive from Germany.
- Steve VK4ALF/VK9M, who was recently active from Mellish Reef, is roaming the world and the wild seas on his 40 foot cutter called "Valiant 40". Steve is from San Francisco. He sold his house and belongings two and a half years ago and decided, together with his wife who is a good sailor, to circumnavigate the world at a leisurely pace. Whilst island hopping in the Pacific he has activated many rare islands over the past year. He goes ashore with his 100 watt rig, a ship's battery, a 26 foot Butternut vertical antenna, a tent, a collapsible table, a chair and logbooks, and he is ready to give the world the wanted country. His wife, who is an amateur also, but not a DXer, minds the boat until Steve's return. Steve is very aware of the DXCC IOTA rules regarding his activity.
- If you worked 4D63RG, it was a special event station celebrating the 63rd anniversary of the Philippines Amateur Radio Association. QSL to DU9RG.
- Len VK8DK, is employed by a local Aboriginal Council at Areyonga, west of Alice Springs. He is the essential-services manager for 230 people. He is about to change his QTH to another locality about 200 km north-west from Areyonga.
- The "local area slim" thought to be in the ZL area has reappeared on the bands again. He was heard working CW on the 10 MHz band as ZL9AI, calling CQ UK, and as VK0MI on the CW portion of the 7 MHz band. He operates only on CW and has a good fist. Nobody knows who the person is. My own theory is that he is a lonely, old-style ships radio officer (not many of them left except perhaps on very old ships still tramping around the Tasman), who has some amateur radio knowledge and, whenever his ship is in this area, he is looking for "some excitement". What is your theory?
- Due to the efforts of the German monitoring system Intruder Watch, the Adventist World Radio, which was operating on 7100 kHz causing a lot of interference to amateur traffic, will be moving to the 31 metre band effective 12 Nov 1995.
- Rudi Mueller DJ5CQ became a Silent Key on 23 November. Rudi was a well known DXer who operated mainly in the Pacific area from Lord Howe Island as VK9LM, Cocos Keeling as VK9CR, and from Christmas Island as VK9XY. Rudi Hein DK7NP will answer the QSL requests from his last activity.
- George VK4XW reports improving conditions on 10 metres. He heard the beacon BV2PU PLO5SA from Taipei, Taiwan at O625 UTC on 28.050 MHz, and worked several Japanese stations on 10 metres.
- Austin VK5WO reports that the Juan Fernandez CE0Z activity made 12,000 QSOs, 42% of them on 40-80 and 160 metres. Their operating QTH was very poor as far as VK and ZL were concerned as there is a 500 feet hill directly in the western path to these countries. Only about seven or eight VKs are in the log of CE0Z. Austin also reported a CW contact with Mani VU2JPS. Mani hopes to operate with a new VU prefix soon and there is no doubt about his legality. Mani's direct address is P Subramanian, Senior Engineer Assistant, All India Radio, Port Blair, 744102, Andaman Island via India.
- One of the photos in this issue is of Dawn ZL2AGX, one of New Zealand's best known DX operators and a regular on the "ANZA", "222" and "YL DX Net" nets. Dawn has been licensed since 1984. She and her husband Dennis ZL2BFI live in a beachside suburb about 50 km north of Wellington in a house which has two separate shacks, so the YL-OM team can operate independently from each other. Dawn is also very active in WARO, the NZ Women Amateur Radio

Operators group of which she is currently the president. Dawn has worked 299 countries of which 230 are confirmed. A delightful couple to meet.

- The Southern Cross DX Net, which used to meet each day at 1100 UTC on 14226.5 kHz has moved to a new frequency of 14255. A persistent, very heavy commercial QRM made the move necessary.
- It has been rumoured that a meeting is scheduled during January to make a final decision about the DXCC status of Scarborough Reef.
- JA6LDD, JH1KRC and JA1BK have operated again from Myanmar from 22 — 27 November as XZ1A. Kan JA1BK, who is the QSL manager for XZ1A and XZ1X, has given the following instructions for QSLing these stations. QSL labels will be printed by computer after the log is entered and four QSO data will be printed on each label. Only one set of labels will be printed. This is to protect the integrity of the QSLing process. Second QSLs will not be issued. Multiband QSOs must be requested in one envelope only. Do not use registered or special delivery mail. QSL to Kan Mizoguchi, 5-3, Sakuragaoka 4 chome, Tama-City, Tokyo 206, Japan.

QSLs Received

8R1AK (4 m — Op); HS0ZBJ (3 w — W8GIO); TL8MS (4 w — DL6NW); 7Z5OO (2 m — W1AF); FM5BH (3 w — W3HNK); 7P8SR (2 m — op).

Thank You

Many thanks to my fellow amateurs whose assistance is always very much appreciated. Special thanks to VK2CJH, VK2KFU, VK2SPS, VK2TJ, VK4AAR, VK4XW, VK5WO, VK6RO, OH0XX and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The 425 DX News, Golist QSL Managers List, INDEXA,* and *Australian Encyclopaedia.*

*PO Box 93, Dural NSW 2158

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Update

WIA News

The manager of the VK4 Division has notified us that his advice of new members was incorrect. Please turn to the *WIA News* item on page 20 of last month's Amateur Radio magazine, and correct the entry for G Metcalfe as VK4ELA to his correct callsign of VK4EZA.

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WIA News

Pressure From Broadcasters on HF Bands

Shortwave broadcasters are making a concerted push for more spectrum in the high frequency bands. This issue emerged at the recent World Radio Conference, WRC-95, held by the International Telecommunications Union (ITU) in Geneva.

While this move could not be dealt with at this Conference, it may affect the Amateur Radio Service in years to come as it will be on the agenda for the 1999 Conference, according to the WIA's delegate to WRC-95, David Wardlaw VK3ADW.

Shortwave broadcasters are seeking access to new HF bands which were allocated in 1979 at WARC-79, and a further lot in 1992 at WRC-92, the latter for single sideband reduced carrier (SSRC) transmissions. This mode of transmission provides more efficient use of spectrum, but requires a more advanced method of reception than simple AM detection, now universally used. Solid-state technology now allows synchronous detection methods to be incorporated in new HF receivers, and modern mass manufacturing methods would make the technology comparatively inexpensive, in time.

The next World Radio Conference in 1997 (WRC-97) may consider some recommendations on the issue, which is likely to be on the agenda of the 1999 Conference. At WRC-99, it is anticipated that bands near 4 MHz up to about 10 MHz particularly will be considered. Fixed and land mobile services have world-wide primary allocations in this part of the spectrum, adjacent to primary broadcasting service allocations. As the demand for fixed and land mobile services is declining over time, this may relieve possible pressure on the HF amateur bands near 4 MHz and 10 MHz.

The situation is being monitored by the WIA's ITU Study Group and Conference Co-ordinator, David Wardlaw VK3ADW, who was a member of the official Australian delegation to WRC-95.

In the meantime, shortwave broadcasters are already taking up more spectrum by moving into some HF amateur bands. From Australia, broadcasters are found in the exclusive 40 metre band allocation. They can be heard on 7010, 7070, 7085, and 7098 kHz, as well as two broadcasters near the 7100 kHz band edge whose sidebands spill into our exclusive band.

WIA Federal Intruder Watch Co-ordinator, Gordon Loveday VK4KAL, said that 40 m continues to be a "happy band" for intruders. They must be stopped, Gordon said, and he urges radio amateurs to protest by sending observer reports. If we don't put up a tough fight for our 40 m band, the shortwave broadcasters will have a stronger argument for more spectrum at a future World Radio Conferences.

Intruder Watch activities pay off. In 1994, reports from *Radio Society of Great Britain* (RSGB) observers were instrumental in having an interfering harmonic of a Russian shortwave broadcaster removed from the exclusive 14 MHz amateur band, along with a French military station on Reunion Island in the Indian Ocean. If you'd like to help Intruder Watch, even on a casual basis, contact Gordon Loveday VK4KAL via his Call Book address.

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System

Most of the information I will give in this column over the next few months is taken from the IARU Monitoring Manual, dated September 1988. The basics never change, but some new developments are advantageous. The first six episodes will be directed at the Aims and Requirements on a day to day working of the Monitoring System, and how national amateur radio societies fit into that system.

What is the IARUMS?

1. It used to be called *Intruder Watch,* and still is for simplicity. It covers the three IARU Regions of the world. The objective is to log, identify and, if possible, have removed ALL non-amateur signals appearing on those frequencies that have been allocated exclusively to the Amateur Service.

Some Monitoring Systems also log non-amateur stations that are operating in breach of the Radio regulations in shared bands.

2. The IARUMS stations may also be asked, from time to time, to conduct "band occupancy monitoring" for special purposes.
3. In August 1985 all three previously independent Region Monitoring Systems were amalgamated.
4. With the increasing demands for spectrum space and the tendency of some administrations to ignore their responsibilities under the ITU Convention, it is evident that the Amateur Service must have a strong, unified and effective monitoring system if it is to retain its frequency allocations.

It MUST present factual and authoritative information about intruders for further action.

5. The IARUMS defines a route by which the ordinary radio amateur, in ANY country, has a means of access to the international bodies in cases of "harmful interference". The system is not perfect, but it represents the best we have at this time.

The co-ordinators in each Region are always prepared to try new ideas, whether it be in the reporting or the transfer of information in the most speedy form. Speed is the essence of success in most cases.

Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1

What's New

Bob Tait VK3UI introduces new products of interest to radio amateurs*

Kevin Cavanagh VK4SP is pleased to announce some new and exciting additions to his product range to supplement the digital modems and controllers.

If you are considering upgrading to 9600 baud packet, Kevin has available the new Kenwood 9600 certified radio. Yes, that's right, Kevin is an official Kenwood dealer. He is able to supply the whole package including the radio, modem/controller and the software.

Also, he has available the **Valor** products such as antenna tuners, switches, dummy loads, Curtis keyers, low pass filters, SWR/power meters and linear amplifiers. The **RMS** products from Italy include power/SWR meters and antenna testers for all bands.

TEKK data radios are now available for 70 cm operation. They are xtal locked and have an output of two watts at 9.6 volts using true FM modulation. Their small size allows them to be integrated with the popular AEA or PacComm controllers.

Heil Sound Microphones are available from Kevin along with other accessory items such as foot switches to provide hands free operation for the DX and contest enthusiast

Contact Kevin Cavanagh on (074) 643 954 or at 222 Brisbane Highway Wanora Queensland 4306.

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Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Objection to Insert

I wish to take issue with the content of the Federal insert in November Amateur Radio. Under the heading of "Cutting the Cost of Licence Fees" it says, *"In March 1995, WIA representatives put the Amateur Radio community's views and objections to the government and won a cut in the proposed fee to $51."*

It should be recognised that it was the actions of the **individual amateur radio operators** of Australia, in providing a strong lobby to their Federal Parliamentary representatives, which played the major role in having the proposed licence fees lowered. This was well before the Federal representatives of the WIA had any contact with the government concerning this matter.

Personal contact and correspondence in my possession from members of the Federal Parliament makes the situation abundantly clear on this point.

There seems to have been an attempt to rewrite history in the way the insert in *Amateur Radio* is worded. I object strongly to such rewriting.

I acknowledge support provided by some Divisions of the WIA towards publicity with which the campaign was launched. Whilst involved in heavy lobbying activities I was relieved of some stress by the promise of the South Australian Division, backed by offers from other private areas, that my telephone bill would be subsidised. Subsequently, the SA Division was in turn reimbursed by agreement of the Federal Council.

I reiterate my opinion that it was undoubtedly the actions of the individual amateur radio operators which effectively produced the resultant reduction in the proposed fees back in March 1995.

We have seen that solutions to problems with bureaucracy can be found if we have the will to make our voices heard. We may well need a similar approach again in the future.

At a meeting on 6 March 1995 called by the Parliamentary Secretary, Mr Elliott, the WIA was offered the opportunity to provide a submission on the future of licensing of amateur radio stations. To date no submission has been provided to the government. I would ask why?

Ian Hunt VK5QX
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Salisbury East SA 5109

(Progress on this submission was reported in the December 1995 issue of Amateur Radio, page 22. Ed)

Repeater Link

*Will McGhie VK6UU**

One Month On

One month to digest the new repeater regulations and my thoughts are little different than before, that is, disappointed. Due to the delay between writing this and you reading it, much could have changed. However, delays aside, continued comment is required about the new repeater regulations. Several of these regulations I find difficult to accept or difficult to understand. Overall I find this legalistic language silly. To give you an example, try reading and understanding the following.

Access control systems

11. (1) If;

(a) an originating station transmits a signal to the amateur repeater station to which the licence relates; and

(b) the amateur repeater station uses a repeater output that:

(I) is not on the same frequency as the amateur repeater station's repeater input; and

(II) is on a frequency on which the originating station is not permitted to transmit a signal;

the licensee in relation to the amateur repeater station must operate the amateur repeater station using an access control system described in subclause (3).

The text is reproduced word for word, and in the same layout as in TLS11. Do you understand what it is saying? I have particular difficulty with subsection (I). I find this type of language very long winded and creates more of a problem than the one it is trying to prevent, that is no room for misunderstanding. It does just the opposite. Let's try and use normal English to break this section down.

If an amateur is using a repeater whose output is not on the repeater's input and is on a frequency that the amateur is not licensed for, then the repeater must have an access control system, such as CTCSS.

Now as you can see, even in plain English, it still does not make sense. I think what it is saying is, amateurs can not be transmitted onto bands they are not licensed for, and repeaters that have such a link, must be fitted with an access control system. The word input, however, confuses me.

Before we lay the blame of the language used in TLS11 squarely on the SMA, it is important to understand that, even though the SMA draw up the regulations, they don't word them. There is a legal requirement that a Government legal department do this. The wording is this department's and not the SMA. Who knows? Perhaps the SMA dislike this legal double talk as much as we do.

Rather than go on and cite several other examples of what I consider a disappointing result, perhaps of equal importance is where are we in all this? Disorganised, is perhaps the kindest description. Close contact with John Martin of *FTAC* has shown how little response there has been from amateurs. The original deadline for comment was extended and two Divisions failed to make the deadline. These being New South Wales and Tasmania. So what happened in these Divisions?

We are also diverse on our opinions on the draft regulations. VK1, VK3, and VK4 see no problems with them, while VK5 and VK6 do see considerable problems. Why such a wide variation of opinion? I have some ideas on why this difference could exist. Please note, it is my opinion and I could be completely wrong. If I'm wrong, please let me know.

Autopatch

One simple example is the "no connection to the public telecommunications network". If you believe connecting a phone to a repeater, so amateurs can initiate a phone call, is a good idea, then this regulation comes as a disappointment. However, if you have no wish to connect a phone to a repeater, and perhaps see it as a bad idea, then this regulation has your approval. But, and it is a big but, it is a restrictive regulation. The fundamental point of all the effort that was put in by several of us over five years ago has been lost. Regulation in an experimental service is fundamentally misplaced. How can you apply regulations that restrict experimentation and expect the experimental service to experiment?

Now I hear you say "but you must have regulation". The Amateur Service has so many regulations that it would not be

amateur radio without them. The point is you have clever non-restrictive regulations. Sensible regulations, like staying within amateur bands, spurious emission levels, non-interference requirements, and control of potential problems, such as swift cessation of interference if it occurs. I'm sure several more could be added but, hopefully, you get my drift. What we do within these regulations should be left up to amateurs.

Returning to the "no connection to the telephone" is a good example to follow through. Just in case you are not aware, the United States has had phone connection to repeaters, called autopatch, for years. New Zealand also allows autopatch. So why not in Australia? What is the real reason for prohibiting autopatch on repeaters? Could it be that the concept is not fully understood by the SMA? I have been told that the SMA do not want non-amateurs to gain control of amateur frequencies. This makes sense. However, a non-amateur can speak on the amateur bands, provided a licensed amateur is in attendance and in control of the equipment. This same level of control can be achieved if autopatch is placed on a repeater. Note, I'm talking about autopatch and not reverse autopatch. Autopatch is where an amateur dials the phone number from a DTMF keypad. Reverse autopatch is where a non-amateur (or amateur) is able to dial the repeater and ask for a particular amateur over the repeater. Even this form of autopatch may not be a problem with a bit of clever thinking, but let's stick to normal autopatch for the moment.

With autopatch an amateur dials a non-amateur. When the non-amateur (note it could be an amateur also) answers, several safeguards are included in the autopatch system. If the non-amateur starts talking about something you do not want broadcast to all, all you have to do is push your PTT. This interrupts the audio from the non-amateur from being transmitted onto the repeater. In effect, it censors the audio. You, as the amateur in control, have several options. As you have hit the PTT you now are able to talk to the non-amateur, just as you do during the normal autopatch conversation. You then inform the non-amateur that the conversation content is not suitable for broadcast. Simple as that. However, let's say the non-amateur persists. You again hit the PTT followed by the disconnect DTMF digit on the keypad and the call is disconnected. Simple as that. It has worked in other countries so why the problem in Australia?

The WIA

I believe the SMA do not understand the in-built safe-guards that are part of autopatch. Why, you ask, don't they understand? The answer is simple. We have not told them! This is where we, as amateurs, often fail. We are poor communicators. In order to inform the SMA of the technical operation of autopatch someone has to have the knowledge of how the system works and, most important, put it on paper. This is where the old saying is repeated "what are the WIA doing?". The WIA are not an endless number of people all waiting to hit the key board to write up yet another submission to be handed onto the SMA. The only people who can do this are you and me. That's right, not the WIA, you and me, because the WIA is you. It took me quite a while to figure out how to bring about policy change in the WIA. You have to do the work. Just saying to your Federal Councillor, "I believe we should be allowed to have autopatch" won't get you autopatch. You have to write an informed submission and see it through. Send it to your Federal Councillor and follow it up. Your Federal Councillor may not understand your submission. Find out if he does and what is required to see it move on.

These types of technical submissions usually end up with FTAC. So not only should you send your submission to your Federal Councillor but also your local TAC in your Division. Most important, continue to follow it up. Don't assume it is going anywhere; it might have been lost or forgotten about. The WIA is not perfect.

So where does this leave autopatch? It means yet another submission to be written for the WIA hopefully to endorse and become the information to gain the freedom for amateur repeater clubs to install autopatch or not install autopatch, as they see fit.

Enough of these long awaited disappointing repeater regulations. All work and no play makes for a frustrating life at times.

Play

On a fun topic, antenna installation at a remote repeater site. Our repeater site at Mt Saddleback, VK6RMS, is located on top of a 2000 ft (sounds better than in metres) hill some 120 km south east from Perth. A working bee was arranged to upgrade the antennas on the site. There is a voice repeater and a digipeater on site. The track to the site is four wheel drive. Several vehicles made the journey with the replacement antennas. The old antennas were removed from the 60 ft tower and the new dual band two metre/70 centimetre antennas assembled and tested at ground level. All worked fine. The antennas were then installed on the tower. All this took some two hours and the result looked good. However, tests showed the top antenna worked fine but the lower antenna had an infinity SWR.

Considerable time was spent trying to find out where the problem was. Tests showed there was an open circuit somewhere. As the antenna had been fully installed and all the coax connector joins sealed, finding the problem proved tedious. Remember, much of this was taking place several metres above ground.

Many misleading possible faults were examined, such as coax adaptors not fitting correctly, but eventually all the sealed joins to the antenna had to be cut apart and examined. It took a while to find the problem. A "N" type male connector had been successfully screwed into a female SO239 (UHF type) socket on the bottom of the aerial. The thin centre pin of the "N" type cannot make a connection to the larger receptacle of the centre socket of the SO239.

This possibility was tried at ground level while trying to isolate the fault. The "N" type male and SO239 (UHF) female tried at ground level would not fit together. Between the inner and outer of the SO239 socket is a ring of insulation that prevents the inner screen of the "N" type male from fitting. However, the antenna SO239 did not have this ring of insulation, and the "N" type screwed neatly in.

How all this came about requires some explanation. The coax that runs up the tower is LDF 450, with a female "N" type at the aerial end. A tail of RG213, a couple of metres in length, is required to connect the antenna to the LDF 450. This tail was made up with a male UHF connector (PL259) at one end and a male "N" type at the other. When tested at ground level the connectors were correctly installed. However, once the test was done the tail was removed to allow for the final coming-together of antenna, tail and mounting frame. It was during this part of the installation that the tail was placed the wrong way round and sealed at the antenna end. The whole structure was then hauled up the tower.

When it came to attaching the tail to the LDF 450 it would not fit because it was the PL259. This caused surprise and confusion but, as the coax tail fitted the antenna "correctly," this was left in the too-hard bin and an adaptor used to mate the PL259 to the "N" type LDF 450 coax. Talk about a comedy of errors!

All this extra activity took over an hour and further added to the saying "trust nothing". The day was a great success with the site now radiating a stronger signal in all directions.

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VK6UU @ VK6BBR

ar

Pounding Brass

*Stephen P Smith VK2SPS**

Hello to all the readers of this column and a very happy New Year. I hope your Christmas festivities were enjoyable and that Santa brought that electronic keyer you were hoping for.

Over the past year I received a number of letters from people who were interested in becoming amateur radio operators and were seeking advice on good Morse publications that would assist them in their Morse examinations. As a result of those letters I have decided to start the new year with a book review of an English publication which I believe will assist new students overcome any fears they may have when they sit for their Morse examination.

The Secret of Learning Morse Code by Mark Francis (G0GBY)

This book can be obtained from Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH 18 8PW, ENGLAND (phone 01202 659910) at a price of UK 4 pounds 95 pence.

It is a shame this book is not available in Australia as it contains a wealth of information. It would also make an excellent addition to your Morse library. The book contains some 88 pages, measures 15 cm x 21 cm x 1 cm, and contains eight chapters with an appendix running from A to F. The chapters are as follows:

Chapter 1 — How it Started

This chapter looks at the early history of telegraphy including the founder, Samuel F B Morse, and some of the problems he encountered during the development of the code.

Chapter 2 — Making up Your Mind

This chapter looks at the many problems facing students and the excuses they have made while undertaking Morse studies. It also explains about having a positive state of mind and that one can achieve anything by practice.

Chapter 3 — Learning the Basics

This chapter covers the approach used to learn groups consisting of the following:

(a) E, T, I, M, S, O, H,
(b) A, W, U, J, V, F,
(c) C, G, K, Q, P, Z,
(d) R, Y, L, X, D, N, B,
(e) Numbers 1 to zero.

The method used is to take five pieces of paper about the size of credit cards; on the first piece write down the seven letters as mentioned in group 1 above, but include E = dit, T = dah, I = d'dit, etc.

This is done with all five groups. You then proceed through each group in turn, until you know all the necessary characters.

Chapter 4 — Receiving the Code

This chapter discusses the different methods that can be used in learning how to receive the code, and covers the D70 Datong Morse Tutor (which has been around for quite a few years) to the RSGB Morse Code Practice Transmissions at varying speeds (I was surprised to find there was no mention of using Morse tape cassettes as a means to receive the code).

Chapter 5 — Sending the Code

This chapter covers the commercial practice oscillators such as the COK-2, and making your own from junk-box parts. The only down-side to this chapter is that the author makes no mention on how to adjust your key (how can you use an oscillator if you don't know how to adjust your key?). On the other hand, perhaps the author presumes you know how to do this; in any case, I believe important information is lacking.

Chapter 6 — Improving your Speed

In this chapter speed is discussed, and advises that to obtain faster speeds you should use a code faster than you are comfortably able to handle. He also mentions if you can copy at 40% accuracy you should then increase your receiving speed by about 5-6 wpm, etc.

Chapter 7 — The Test Itself

The author talks about his own experience in sitting for the examination and some of the problems he encountered.

Chapter 8 — Other Information

This chapter looks at electronic Morse code readers; and the pros and cons are discussed about additional reading material which the student might benefit from.

Appendix A Through To F

The appendices cover a range of Morse related topics, from using the Q-Code to abbreviations, and from sample Morse tests to additional sending practices.

I found the book to be well structured, pleasant reading and containing a lot of information that will assist potential students in their Morse Code examinations. However, on the negative side was the lack of information concerning the adjustment of a straight key. I hope the author will include this in future editions.

There are two other excellent books on Morse code which have been on the market for about three years. They are **Learning Morse Code** by Rex Black VK2YA, and **Morse Code, the Essential Language** by Peter Carron Jr W3DKV.

Learning Morse code is an excellent book and is ideal for the beginner. It includes two Morse cassettes and contains a wealth of information. The book is available from WIA Divisions.

Morse Code, The Essential Language is an American publication and is an excellent book for both the beginner and the advanced operator. It covers everything from early history through to modern electronic keyers. I hope to do a review on it later in the year. The book is well worth the money and can be purchased from **Daycom Communications Pty Ltd** for $16.00. Further enquiries can be made with Daycom on (03) 9543 6444.

Next month we will look at straight key construction which I hope all home brewers will find exciting.

**PO Box 361, Mona Vale NSW 2103*

ar

Spotlight on SWLing

*Robin L Harwood VK7RH**

Well, 1996 has arrived! A New Year has commenced and it is apparent that shortwave will continue despite budgetary cutbacks and the disappearance of some HF facilities.

Recently there have been developments with a clockwork-powered radio in South Africa, which has now come onto the market. It is the brainchild of Trevor Bayliss, who wanted to develop a fairly cheap radio that didn't rely on batteries, particularly for Africa and Asia where the cost of these is rather beyond the reach of the average person.

With the assistance of the British Overseas Development Corporation and the **BBC World Service,** production commenced recently in South Africa with the aim of some many thousands of units per month. The idea behind the clockwork mechanism is not really new yet would be quite feasible in areas where there are difficulties in obtaining batteries, such as Africa. It must be remembered that Alf Traeger developed the pedal-powered radio for the Flying Doctor Service in the late 20s and early 30s, here in Australia. Also there were similar set-ups employed

by POWs in Europe in the Second World War and by some Aussie troops who were trapped in Timor, to monitor shortwave transmissions.

However, to return to the Bayliss model. I believe that 20 seconds of winding will provide up to 38 minutes of power and that the model does have AM/FM plus one shortwave band, probably the tropical bands from 3 to 12 MHz. Other models for more developed areas, such as Europe and North America, will have from 6 to 18 MHz.

The price within Africa will be cheaper than it will be for Europe and North America. The idea is that these markets will subsidise the price for Africa. The price in a well-known department store in London is 75 pounds sterling, whereas in Africa it will be about $US80. The set has not been designed as a DX machine but for the average listener who wants to keep in touch with what is happening around him. It is not a sophisticated receiver. I believe that the clockwork mechanism makes it weigh more than a conventional battery transistor model. Whether it will succeed in African markets is debatable as the number of conventional models is in the millions.

Tuning around recently, I came across **Radio Slovakia** broadcasting from Bratislava to Australia. The programming was in Slovakian, naturally, and the broadcast was for 30 minutes from 0900 UTC. The frequency chosen is unusual. It is on 17,485 kHz, which is well outside the 16 metre allocation which means that it is free from any adjacent interference. I think that the Slovakian programming may be preceded by a 30 minute English release, but this cannot be confirmed.

All India Radio in New Delhi has been quietly upgrading its transmission facilities over the past 12 months and it is pleasing that it has significantly improved the modulation quality. For many years AIR has been broadcasting on 17,387 kHz and on a 19 metre channel in its General Overseas Service to Australia and the Pacific at 1000 UTC, but poor propagation over the years has often made it inaudible. Recently, a 500 kW sender was fired up on 13,700 kHz at that time and the signal level is excellent as is the audio. AIR is eager to receive reception reports and the address is given frequently plus the added option of forwarding your reports via the Indian High Commission in Canberra. The morning release at 2100 UTC is around 9,940 kHz, yet it must be employing an older sender as the audio quality is not as clear as the 1000 release on 13,700 kHz.

The new facilities are also being targeted to the Gulf States and the Mid-East between 0400 and 0600 on 15,075 and 15,050 kHz. Signal levels vary daily in the Hindi and Arabic releases. The shortwave relay of the domestic service continues on the unusual allocation of 10,330 kHz, which is audible at various times of the day. Hindi programming is the norm; however, several English news bulletins are aired throughout the day.

The **VOA** has been undergoing some financial cutbacks in the US Budget, which saw the demise of English language broadcasts directed to Europe plus reductions to other European language services. The future of the VOA is still uncertain and the popular VOA-Europe feed, which is aired over various European cable systems, is going commercial. The VOA is looking for a commercial partner who would sell advertising to be aired.

In mid-November, the entire US Government was paralysed by a budget crisis and the VOA was affected in some areas. There was stand-by programming available to cover regular non-news based programming, although news and current affairs were spared. After the budget crisis was temporarily averted, the VOA resumed its normal output, although it did warn listeners that, as the crisis was only temporarily resolved, a similar situation could arise in mid-December.

The **Voice of Russia** in Moscow recently revealed the extent of their enforced cutbacks in Joe Adamov's "Moscow Mailbag". Apparently they have only 100 senders now at their disposal compared to the 400 plus they previously had when the USSR existed. 60% of these are in Russia proper whilst the remaining 40% are scattered throughout the CIS nations. Staffing levels have also been reduced significantly.

It was recently pointed out to me that the RAN communications station **VHP/VIX**, which was located at Belconnen in the ACT, ceased operating on CW as of 30 September 1994. VHP/VIX was easily heard on 8478 and 6428.5 kHz and, for many trying to master the intricacies of Morse, it was an invaluable aid and was much easier to copy than the Slow Morse transmissions on 80 metres. The RAN daily drill sessions from VHP and the weather from VIX was always reliable. Sadly, they are now a part of history.

Well, that is all for this month's column; until February, the very best of listening and 73.

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VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Messages

Peter VK1PK further advises that the EME contact between Canberra and Italy planned for 12 December (reported in these columns last month), will now be attempted on 432 MHz instead of 1296 MHz, with Chris VK1DO organising the equipment and operating details. By the time you read this the attempt will be over so I await information on the results.

John VK3ATQ reported working Frank VK7ZMF on 3/11 at 2000 with his beam 10° north of east, exchanging 5×1 reports. Frank's beam was pointing in the same direction, so it appears to have been a backscatter contact from ionised air over the Pacific. This was confirmed by loss of signal on the direct path. Frank VK7ZMF runs 100 watts to a 16 m boom own design Yagi, while John uses 100 watts to a NBS 6 element at 20 metres.

The above phenomenon is often noted here in VK5 when we work VK6s; we can hear (and work) VK2, 3 and 4 on backscatter and signals are usually affected by flutter.

On 6-7/11, **Frank VK7ZMF** had a good JA opening and filled two pages of his log book, an interesting extension of the JAs which have been worked in Queensland.

John also said that **Brenton VK7JB** has erected a 60 metre per leg "V" beam aimed at Melbourne, but so far has not made it across Bass Strait with 10 watts (IC-551). However, Brenton is in the process of building a 100 watt linear. It would be interesting to hear how the combination of the linear and "V" beam works. A similar beam was used by Darrin VK0IX for his contacts from Antarctica last January.

John VK4KK reports several strong Es openings, one of the best on 6/11 to VK2, 3, 5 and 7. On a number of occasions, around 11.30 pm local time, John has observed very strong video from New Zealand on 50.750 and 50.760, NZT 2.30 to 3.30 am. Seems rather late for Es, but I am never surprised when strange happenings occur on six metres.

Remember the old adage, six metres never closes, only the operators stop!

John also reported on 16/11 JA2 and JA3, and on 17/11 JA2 and JA5. Signals were not strong and were available around 0500. A week earlier, ZLs had an opening to JA but no details are available.

Steve VK3OT issued a bulletin about solar information, being an excerpt from The 50 MHz DX Bulletin, September 1995, in which Arne SM7AED writes: *A total of three sunspot groups potentially belonging to cycle 23 have now been observed at Learmonth Solar Observatory. The major significance of new cycle spots lies in their prediction value for solar minimum. Typically, minimum does not occur until at least 12 months following the appearance of the first spot group of the cycle. Details for the last three cycles are:*

Cycle #	*First spot*	*Minimum*	*Latency*
20	*Sep 1963*	*Oct 1964*	*13 months*
21	*15 Nov 1974*	*Jun 1976*	*19 months*
22	*31 Mar 1985*	*Sep 1986*	*16 months*

On the basis of past behaviour we would thus expect solar minimum to occur between June and December 1996, and the duration of cycle 22 to lie between 9.7 and 10.3 years. The highest reading for October 1995 was on the 12th, with a flux of 92.

From VK3 south, last JAs of Cycle 21 worked 30 March 1984. First JAs of Cycle 22 worked October 1987, a break of 3.5 years. Last JAs worked from VK3 south in late 1994, projected major opening October 1997, but more likely to be October 1996.

VK4s into JA on 14 October and again on 7 November. A JA6 heard the VK3SIX beacon and VK3LK on 14 October after a minor solar disturbance ... de **VK3OT.**

Two Metres

Phil VK5AKK is working many stations on two metres from his new site at Blackwood in the Adelaide Hills, 525 metres ASL. All contacts were made with 100 watts to a 13 element K1FO Yagi, and the following are highlights from his log.

17/10: 1201 VK3AUU 5x6, 1235 VK3TUO Stawell 5x2, 2234 VK3AUU 5x9, 2237 VK2TWR Nimitabel 5x2, 2240 VK3DUT 5x9, 2326 VK3AJN Wangaratta 5x2. 22/10: 2340 VK6AS Esperance 5x4, 2344 VK6KDC 5x2. 23/10: 0010 VK6WG Albany 5x2, 0818 VK6WG 5x9, 1149 VK3TUO 5x3, 1150 VK3BRZ 5x5, 1203 VK3AMZ 5x5, 1213 VK3AUU 5x9, 1316 VK6DM 5x6.

24/10: 0803 VK3DUT 5x9, 0818 VK3TNW 5x2, 0822 VK3TV 5x6, 0833 VK3KWA 5x5, 1008 VK2TWR 5x2, 1012 VK3AJN 5x1, 1102 VK3TUO 5x7, 1104 VK3AXH 5x9, 1111 VK3II 5x4, 1115 VK3BRZ 5x9, 1120 VK3DQW 5x7, 1224 VK3KMN 5x5, 1231 VK3AMX 5x1, 1242 VK3KLO 5x1, 1329 VK6AS 5x7, 2157 VK3DUT 5x7, 2212 VK2TWR 5x2, 2228 VK6WG 5x7, 2230 VK6AS 5x9, 2250 VK3AUU 5x9, 2307 VK6KDC 5x7. 25/10: 2245 VK3ZL 5x2, 2250 VK3DUT 5x1. 13/11: 1150 VK6DM 5x1. 14/11: 1338 VK6BE 5x3, 2140 VK3AUU 5x6, 2155 VK6AS 5x2. 18/11: 1005 VK3AUU 5x9, 1014 VK3RZ 5x4.

I have run the above list to indicate that there is more VK3 activity than is sometimes apparent, although it is obvious from some of the relatively weak reports that it requires a good site for such results.

Sign up a new WIA member today — we need the numbers to protect our frequencies and privileges.

New 24 GHz Record

On Sunday, 5 November 1995 at 1122, **Neil Sandford VK6BHT/p** at the QTH of VK6KZ in Melville Western Australia (Lat 32° 2' 47" S, Long 115° 48' 15" E) OF77VW, and **Walter Howse VK6KZ/p** at the end of The Beacon (name of street!), Swan View near Perth (Lat 31° 53' 23" S, Long 116° 03' 40" E) OF88AC, worked each other on 24048.025 MHz. Signal reports on SSB were 5x5 to VK6BHT/p and 5x4 to VK6KZ/p. The distance was 29.9 km and creates claims for inaugural distance records for both Western Australia and Australia for the 24 GHz band.

Both were using DB6NT Mark 2 transverters with an estimated power output of about 0.4 mW at 24 GHz and a receiver noise figure of approx 10-12 dB. Neil used a 570 mm dish and Walter a 610 mm dish, both with penny feeds, gain about 40 dB with a 3 dB beam-width of 1.5 degrees, ERP 4 watts. IF of 144 MHz with 10 mW input.

Local oscillator G4DDK 004 on 2390.4 MHz from 99.6 MHz crystal, fifth overtone. The five times multiplier was a G3WDG 009S with 50 mW output on 11952 MHz (X2 = 23904 + 144 = 24048 MHz). Power supply — 12 volt battery at 400 mA maximum.

The contact followed the first over a 4.4 km path and others at 22 and 28 km. Unfortunately darkness, the arrival of rain and VK6KZ being well overdue to a cooked roast dinner, prevented attempts at a longer distance. Neil returned to Geraldton (400 km north of Perth) the next day. Neil operated from Wal's QTH because Wal knew the Perth metropolitan area better than he!

Wal used his Magellan Trailblazer GPS to determine each latitude and longitude. The distance of 29.9 km was verified as correct by John Martin VK3KWA, Chairman of FTAC, and by VK5LP, so the claim goes into the record books. Good work.

Work is proceeding to build Hemt amplifiers for each station to provide increased output power (approx 70 mW) and improved receive noise figure (approx 4 dB).

Thanks to Wal VK6KZ and John VK3KWA for the above information.

[As a matter of interest, I have been informed that in 1993, VK2XSO was involved in a 24 GHz contact over a distance of 396 km. This was probably a contact using wide-band equipment, but no claims were lodged. Can anyone supply more details please?]

Other VK6 news, courtesy **Wal VK6KZ,** is that the Perth beacons were off for the two east-west six metre openings on 5 and 6/11 due to power supply failure. Thanks to Don Graham VK6HK for restoring the beacons to service on Tuesday morning 7/11.

Bill Hockley VK6AS in Esperance has renewed his 144 MHz skeds with Wally Green VK6WG in Albany with great success. If you hear Bill on 7 MHz (!) don't be surprised with a strong signal from his three element full sized beam!

Al Edgar VK6ZAY, using his self-designed new 10 GHz transverter, worked VK6KZ for an initial contact over a sea-level 24 km path — Rockingham to Fremantle North Mole. Al won the home-brew contest at the Hamfest with his transverter.

Bruce Douglas VK6BMD has been working 2.4 GHz SSB with **Al VK6ZAY** and **Alan Woods VK6ZWZ. Arnold Shepperson VK6VV** is also active on 2.4 GHz SSB. The impending VHF Group Field Day has encouraged this group to try terrestrial paths rather than their more usual satellite work.

From the US

December 1995 marked the 50th anniversary of *The World Above 50 MHz* in *QST,* the modern-day counterpart of *The World Above 50 Mc,* which made its debut in *QST* in December 1945.

In December 1939, *On the Ultra Highs*

appeared as a new *QST* column under the byline of **Ed Tilton W1HDQ,** and covering the then 56, 112 and 400 Mc bands, which were replaced in 1945/46 by 50, 144, 220, 420, 1215 MHz; 2.3, 3.3, 5.65, 10 and 21 GHz.

War-time developments pushed interest to above 300 Mc, and in May 1943 Ed renamed the column *On the Very Highs.* The columns faced interruption during the later years of World War II and reappeared in October 1945, to finally take its modern name *The World Above 50 Mc* in December 1945. Not one month has been missed since.

Now 88 years of age, Ed Tilton lives in a nursing home in Florida. Unfortunately, he is no longer active or able to correspond with the many friends he made during his years with the ARRL.

Thanks to **Emil Pocock W3EP** for the above information contained in *The World Above 50 MHz* for December 1995. As the scribe for *VHF-UHF, An Expanding World,* on behalf of Australian amateurs, I congratulate *The World Above 50 MHz* and its editors, past and present, on its 50th anniversary, and may the columns continue to serve the amateur fraternity for many years to come.

Last month I mentioned that I was entering the 27th year of this column, which is a long way behind the US column. However, the earliest *Amateur Radio* magazine that I possess is February 1954, and I note therein that VK5XU was editing columns with the title *Fifty Megacycles and Above.*

VHF/UHF Field Day

Barry VK5UBJ lives at Aldinga Beach and is Secretary of The South Coast Amateur Club. He advises the club will again be a starter in the VHF/UHF Field Day on 14-16/1, operating VK5ARC from Loud's Hill near Mount Terrible which is just south-west of Willunga Hill, in grid PF94.

Alan VK5BW will also operate in the Field Day from his usual portable location at Mount Bryan, using 50, 144, 432 and 1296 MHz. Alan said it was likely that **Norm VK2XCI** at Broken Hill would participate.

Alan also advised that **Bob VK3ZL** is now active on 2 metres SSB, running ten watts to a five element beam. He lives at Miranda about 50 km west of Hamilton. He plans to also operate 432 MHz.

From his portable site on 11/11 VK5BW worked VK3ZL four times by aircraft enhancement, with signals available from 10 to 15 minutes at times. Another good catch was VK2EFA in Broken Hill. Good tropo on 12/11 enabled Alan to work 15 stations.

Europe

Ted Collins G4UPS reports that **Fred Fish W5FF,** has now completed working all grid squares in continental USA on 6 m with a QSO in June to N1MLE for square 484! Fred has now worked 843 grid squares on 6 m, with 128 countries confirmed. His XYL **Lee K5FF** received DXCC No 1 for 6 m and Fred No 2.

Anyone still chasing a QSL from **Costas SV1DH,** be advised he has moved and his current address is Dr Costas Fimerelis, 41 Aristofanes St, Halandri 152-32, Greece.

Ted also reports that the first legal QSO from Tunisia on 6 m occurred on 23/10/95, when 3V8BB contacted SM7AED, exchanging 599 reports on 50.110. On 24/10 3V8BB worked PA stations, 25/10 to GJ4ICD, and 26/10 into the UK, first to G3HBR and finally to G4UPS at 1118.

Looking through Ted's log for October, it is interesting to observe that 14 beacons were copied, ranging from CT0WW in Portugal to SV1SIX in Greece, a spread of right across Europe, with other beacons in between. Actual contacts were rather limited, predominantly to EH, F, I, IS0, SM, CT1 and of course 3V8BB.

News from **Geoff GJ4ICD** arrived via **Dave VK2KFU** (with thanks). His info is a collection of highlights from Europe and USA. In much the same way that we experienced TEP to Japan during October, so too from the US to Argentina. 29/9: WA5 to LU; 3/10: WA5, CO to LU; 5-6/10: W5 to LU; 13/10: 7Q7RM to IK8DYD. Quite a few Es openings during October in both the US and Europe — equivalent to April here!

Emil Pocock W3EP, in *QST's* December *The World Above 50 MHz,* reports that: *The unusual outbreak of sporadic E on six metres this past summer may have also affected two metres. DUBUS No 3 for 1995 included 19 pages of 144 MHz sporadic E reports from Western Europe, accompanied by nine maps showing typical paths. Some of the European openings were quite spectacular. On 12 June, for example, EA9AI (Ceuta, North Africa) ran off more than 200 Europeans between 0940 and 1235 — that is around 70 per hour! Similar reports from Japan, published in Mobil Ham for August, September and October indicate that the sporadic E season in Japan was also lively. Japanese 2 metre operators had opportunities to work Korea (DS and HL), Russia (UA0) and Taiwan (BV) in addition to each other. The US and Europe each experienced more than 15 dates with two metre openings between mid-May and Mid-August, or roughly one every three days.*

Emil also wrote that: *The Europeans set two new microwave records over the summer. DB6NT and DF9LN spanned 2.1 km on both 145 and 241 GHz during a series of tests on 26 June. The 241 GHz contact set a new world record. The pair used DB6NT-designed transverters and 25 cm dishes. On 7 July, HB9MIO and DK4GD, both operating from favourable portable sites, made a 114 km contact on 76 GHz. Their rigs ran 2 mW on CW with 30 and 40 cm dishes. Receiver noise figure was less than 13 dB.*

Closure

The main interest this month will be the continuation of the Ross Hull Contest and the VHF/UHF Field Day which combines with the Ross Hull over the weekend of 13-14 January.

These days I cannot go out portable, but I certainly hope to give field stations contacts on 50, 144, 432 and 1296 MHz, especially now that I have a 100 watt *louden-boomer* on 1296!

Closing with two thoughts for the month:

1. There's not much point in spinning a yarn if the audience loses the thread, and
2. Be yourself. Who else is better qualified?

73 from The Voice by the Lake.

**PO Box 169, Meningie SA 5264 Fax: (085) 751 043*
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

C S (Charles) HIGGINS VK2LO

ar

Repeaters — additions, deletions, alterations. Have you advised the WIA of changes to the Repeater List?

WIA November Meeting With the SMA

The WIA met with the Spectrum Management Agency (SMA) in Canberra on 30 November last. The full WIA Liaison team attended, comprising Neil Penfold VK6NE, Roger Harrison VK2ZRH and David Wardlaw VK3ADW. Nine officers from various SMA teams attended, but not all were there for the whole of the meeting which ran from 10 am to 4.30 pm.

There were five major areas for discussion, along with a number of minor matters. The WIA set the agenda for the meeting. The major issues were:

- the 80 metre DX window;
- Technical Licence Specifications;
- Interference;
- Licensing; and
- the Examination System.

80 m DX Window

The WIA put a submission to the SMA in late November, before the Canberra meeting, proposing Australian amateurs be permitted to use the band 3760-3900 kHz on a secondary basis, during evening hours between 1700-0700 local time Mondays to Thursdays, and from 1700 LT on Fridays through 0700 LT on Mondays (ie 24-hour weekend operation).

This submission followed a survey of some 300 current primary service licensees assigned channels between 3750 and 3899 kHz. Responses were received from more than 55% of licensees surveyed. Of those who returned the WIA's questionnaire, more than 80% indicated no objection to the WIA's proposal for shared use of the band during night time hours. Objections were received from only 18% of respondents, who were licensed to use only 5% of the channels between 3750-3900 kHz. A number of users have more than one frequency channel assigned in this range.

The WIA's detailed submission included tabulated and graphical summaries of the questionnaire responses. This final submission, drawn up by Roger Harrison VK2ZRH, was derived from an initial survey analysis and recommendations drafted by the WIA Victorian Division.

The SMA has asked the WIA to provide further details in support of the proposal to expand the 80 m DX Window, particularly in regard to amateur allocations in this area of the spectrum in other countries around the world, and the issue of self-regulation among amateurs in Australia should the DX Window be expanded in the future. The WIA-SMA Liaison team will progress this submission as a matter of priority.

Technical Licence Specifications

Discussions under this topic covered the WIA's response to the draft Beacon and Repeater TLSs (TLS 10 and TLS 11), errors in the existing TLSs, comments on emission designations used in TLSs, background to changes in the TLSs made in mid-1995 and the apparent loss of privileges for Unrestricted licensees with the limitation of wideband FM on the 10 metre band to 29 MHz and above where previously it was permitted from 28 MHz.

A lengthy submission commenting on the draft Beacon and Repeater TLSs was prepared and submitted by WIA Federal Technical Advisory Committee (FTAC) Chairman John Martin VK3KWA before the Canberra meeting.

The SMA indicated they will send a written reply to the WIA on this submission, but were unable to indicate when this might be forthcoming as other radiocommunications issues presently have priority with the SMA's time and resources.

The five principal amateur TLSs were gazetted twice in 1995, first on 2 June, and again on 5 July. There were changes made to the Unrestricted, Novice and Intermediate TLSs in the second gazettal. The greatest changes were to the Novice TLS, in section 10, where eight transmission modes were added for telegraphy and data modes on the 3.5 MHz and 21 MHz bands. Two telegraphy/data modes were added for the HF bands in Schedule 2 in the Unrestricted and Intermediate TLSs.

The SMA explained that these were inadvertently omitted from the original drafts and that they were added when an opportunity arose in June to amend the TLSs.

Errors in the existing amateur TLSs were drawn to the attention of the SMA in a WIA submission drafted and sent to the SMA by John Martin VK3KWA. The errors involve transmission modes on 50.0-50.3 MHz, incorrect specification of some telegraphy/data modes and the omission of footnotes warning of frequencies to avoid on the 160 m, 80 m and 30 m bands. The SMA indicated they will see to amending the TLSs in due course, when the opportunity arises. The WIA was told that, despite what happened last June, amending TLSs is not a simple procedure.

On the issue of limiting wideband FM (16K0F and 16K0G modes) for Unrestricted licensees to use above 29 MHz in the new TLSs, where previously it had been permitted across the whole of the 28-29.7 MHz band, the SMA had no immediate explanation but offered to respond to the WIA by letter.

Interference

Issues regarding interference to amateur activities on the 160 m, 2 m and 70 cm bands from other services, and from the possible future installation of Windshear air safety radar systems in Australia, were discussed at the Canberra meeting.

As many amateurs well know, interference to repeater systems on 2 m from pager systems operating above 148 MHz has been a particular problem for many years. A technical report on the subject, compiled by Will McGhie VK6UU, was presented to the SMA at the previous WIA-SMA meeting last May. An update, again from Will McGhie, on a recent pager interference problem, and its solution, was given to the SMA in November. The SMA said, as a general principle, they will investigate all well-documented interference complaints, and that the priority given to any such investigation is made by the choice of the local SMA Area Office.

Recent experience, and cooperation with the SMA, has indicated a number of ways to successfully approach pager problems on 2 m. To improve the situation for repeater system operators, the WIA, in conjunction with the SMA, will develop a flow-chart and "check box" system as part of a self-managed solution to investigating interference sources to 2 m repeaters. Providing a copy of this check list, along with a written complaint, should help the SMA to take the appropriate action in the

future, when it comes to dealing with such interference.

Recent interference problems on the 160 m and 70 cm bands, arising from other services, had already been dealt with before the November meeting in Canberra. However, the SMA will in future advise the WIA of any new licences which may affect activities on amateur bands, particularly on bands where amateurs are a secondary service (eg 420-450 MHz), and work in conjunction with FTAC to avoid possible mutual interference. This procedure will also apply to Windshear radars, which operate immediately adjacent to the 6 m and 70 cm bands.

Licensing

The WIA sought discussion with the SMA regarding progress on reciprocal licensing agreements, improvements to short-term visitor licensing, information on SMA policies regarding spectrum licensing, and the Morse code qualification for amateur licences.

Australia presently has made approaches to seven countries, these being Argentina, Austria, Hong Kong, Italy, Kiribati, Peru, South Korea and Vanuatu. The SMA had good news for the WIA on two of these. Hong Kong and South Korea are agreeable to developing reciprocal licensing arrangements with Australia.

For overseas amateurs coming to Australia on short-term visits, the WIA is seeking to institute simple arrangements similar to that which exists in other countries. For example, the so-called CEPT licence in Europe allows an amateur to "roam" from country to country without having to apply for a country's licence or call sign; the amateur simply uses the appropriate country prefix in front of his or her home-country call sign. The Organisation of American States (OAS) adopted an International Amateur Radio Permit for use in the Americas, last June, which operates in a similar way.

New Zealand permits operation by visiting foreign amateurs, using FM on the 2 m band, who only need add ZL1 (or 2, 3, 4) as a prefix to their home country call sign. Visitors do not pay a licence fee.

Following discussions of the issues at the Canberra meeting with the SMA, the WIA will develop a submission on the matter, and to outline a changed approach to short-term licensing for visiting amateurs. The SMA is proceeding with work on the harmonisation of examination standards with CEPT countries, which will no doubt help with this issue.

The WIA discussed with the SMA the matter of spectrum licensing and how it may affect the Amateur Service in the future. The SMA said that only the 501-505/511-515 MHz band had been recommended for spectrum licensing and consideration of all other bands had been deferred. The WIA will take up the issue with the Radiocommunications Consultative Council (RCC) spectrum licensing working group, through David Wardlaw VK3ADW.

The SMA said amateurs were the largest single group of respondents to the recent public inquiry into spectrum licensing.

Regarding Morse code qualification for amateur licensing, the SMA said that their policy was to align with the ITU regulations as far as possible. Additionally, qualification in Morse code was used as a means of providing a level of extra privileges for amateurs. In the event of any future changes, the SMA said they were unlikely to act unilaterally as any change had many ramifications, particularly relating to reciprocal licensing, which would need to be worked through.

Since the SMA changed to a new computer management system early in 1995, lists of new licensees and statistics on amateur licensing were no longer provided to the WIA. Previously, these were provided under an informal cooperative arrangement. The WIA is working with the SMA to once again obtain this information and will put in a brief submission as a matter of priority.

Examination System

Revision of the Memorandum of Understanding (MOU) between the SMA and the WIA Exam Service has been under way for more than a year, and the WIA sought advice on progress. In addition, the issue of invigilator requirement for remote area examinations, raised at the meeting last May, was discussed, along with the matter of the syllabus and exam question banks not being in harmony with the current TLSs and Regulations.

The SMA explained that the many changes which had occurred in the SMA over recent times had occasioned delays and some loss of continuity in the revision of the MOU, but it is actively under way again. An SMA officer was to visit the WIA Exam Service operation in Melbourne before Christmas, to assess and report on current practices and procedures.

Regarding remote area invigilator requirements, the WIA proposed that, rather than using the Income Tax Act definition of remote areas, a definition based on travelling time would be administratively simpler. The SMA said they were prepared to consider this further and asked the WIA to put up a more detailed submission.

The SMA said they were progressing with consideration of the AOCP syllabus and question bank, which the WIA submitted earlier in 1995. Finalisation of the review of the AOCP syllabus was anticipated by the end of January, and the question bank some time later, although no time frame was proposed at this point.

Until the relevant information booklets on the Amateur Service, RIB70 and RIB71, were revised, amateur licence candidates would continue to be examined on the previous regulations, the SMA said.

Other matters discussed at the November WIA-SMA meeting included use of the AX2OOO Olympic Games special event call sign, which the WIA wants to extend the permitted period of operation from one month before and one month after the opening ceremony, to six months or more before and up to three months after; further action on proposed amateur use of LF in the 150-200 kHz region; and a number of issues surrounding the allocation and use of amateur call signs. Armed with more information as a result of the November meeting, the WIA is developing further submissions to put before the SMA in all these matters.

More detailed information on all the matters discussed at the November meeting will be included in later *WIA News* items.

Following the meeting, WIA Federal President Neil Penfold VK6NE said that it had been the most productive of recent times, and augured well for future liaison between the WIA and the SMA.

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

This month, while the sunspot number remains static, I am trying an alternative format for the HF predictions. Both formats have their advantages. I leave to you the decision of which is better.

For those who prefer the tables, last month's issue tables are effectively identical to the values that would have been used this month. The sunspot number remains unchanged. The graphs show the ALF (absorption limiting frequency — **dotted line**), MUF (maximum useable frequency — **broken line**) and OWF (optimum working frequency — **solid line**). It is a standard form for presentation of HF predictions, appearing in many other places.

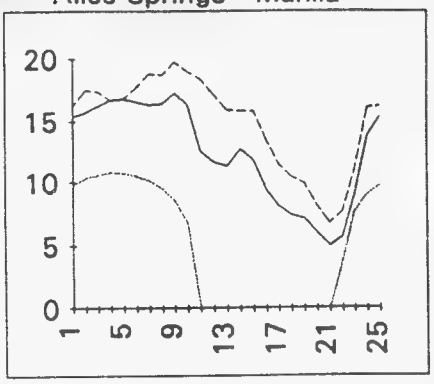
The graphs are for the path indicated. Different paths can be used. The **vertical axis is frequency** (MHz). The **horizontal axis is the time of day.** Due to the system being in development the time displayed is really UTC+1. This means that you need to subtract 1 from the horizontal scale to get UTC. This will be corrected if the system proceeds.

The predictions were made using one of the IPSD stand-alone prediction systems. Finally, I could not let the year commence without noting that a new sunspot cycle is evident. More will be said next month on this subject.

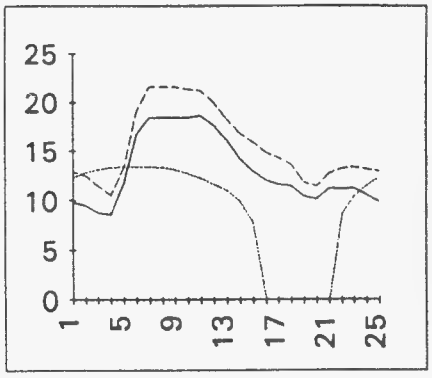
Dotted line — Absorption Limiting Frequency (ALF)
Broken line — Maximum Useable Frequency (MUF)
Solid line — Optimum Working Frequency (OWF)

Vertical axis — Frequency in MHz
Horizontal axis — Time of Day (UTC-1)

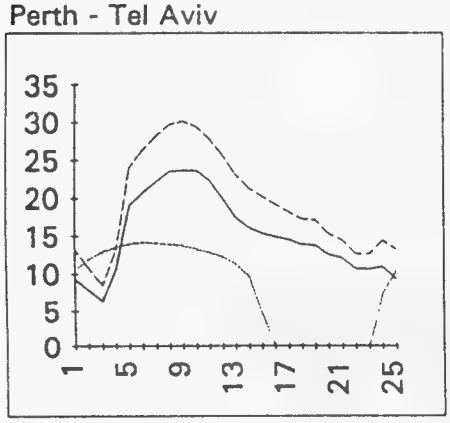
Alice Springs - Manila



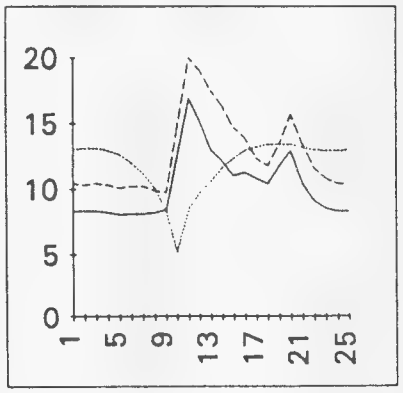
Hobart - Athens



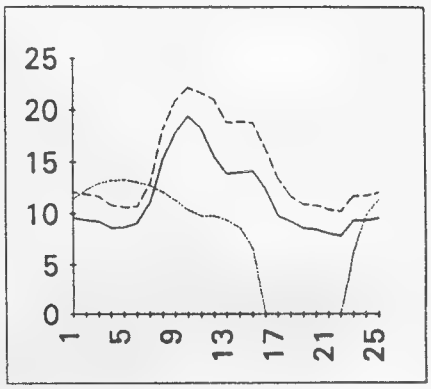
Perth - Tel Aviv



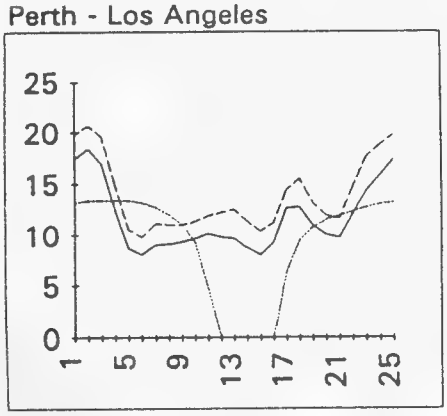
Melbourne - London



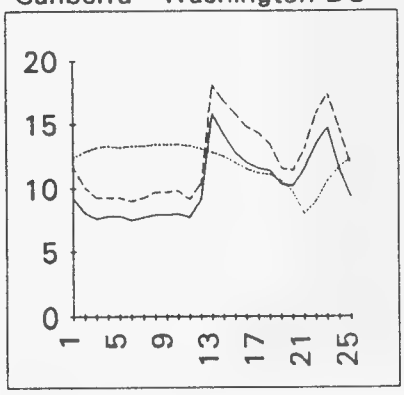
Darwin - Paris



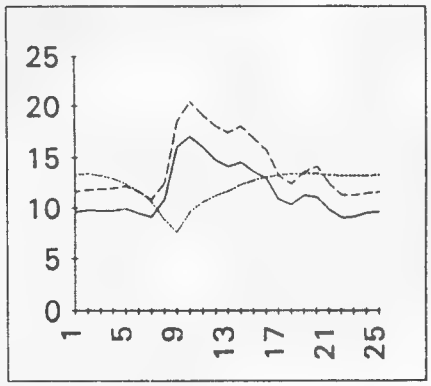
Perth - Los Angeles



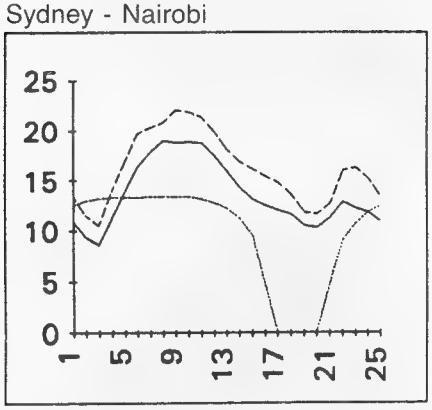
Canberra - Washington DC



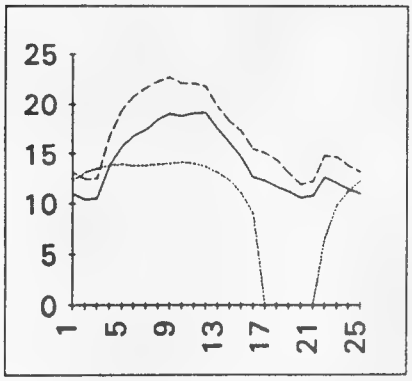
Brisbane - Rome



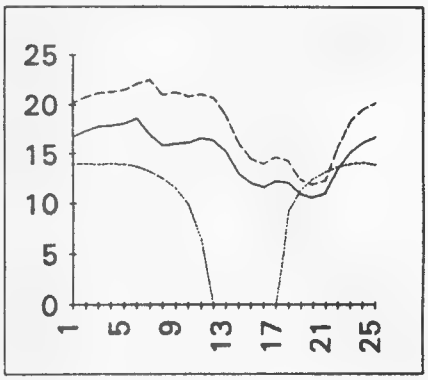
Sydney - Nairobi



Adelaide - Harare



Perth - Tahiti



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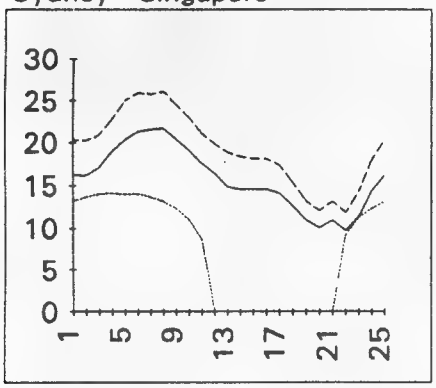
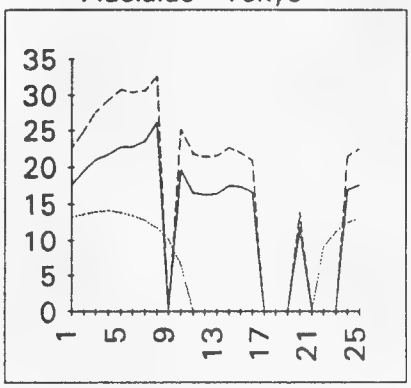
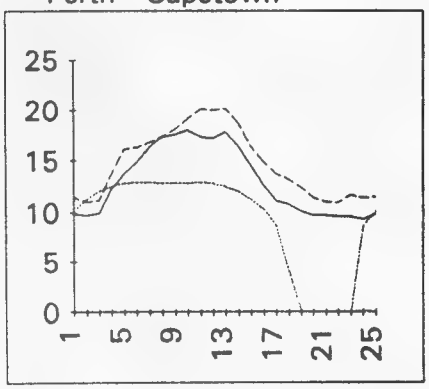


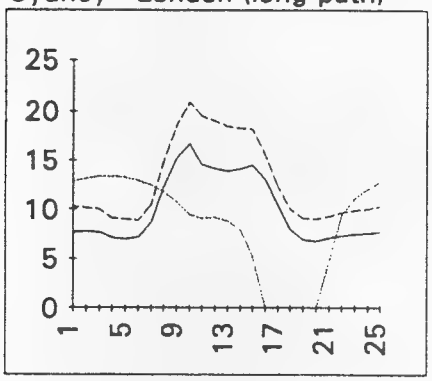
Adelaide - Tokyo



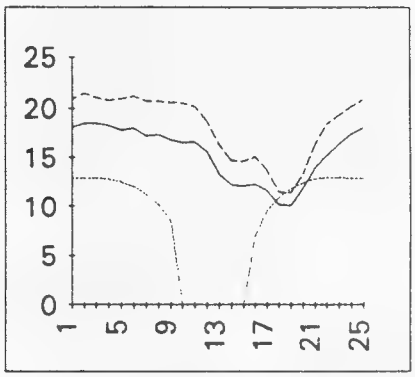
Perth - Capetown



Sydney - London (long path)



Adelaide - Pitcairn Is.



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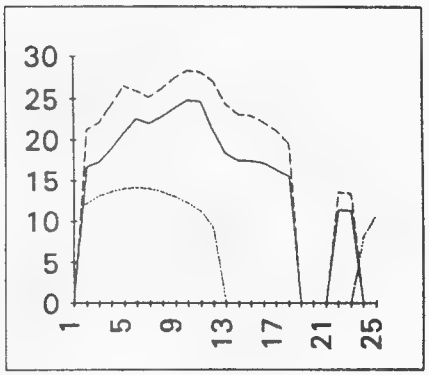

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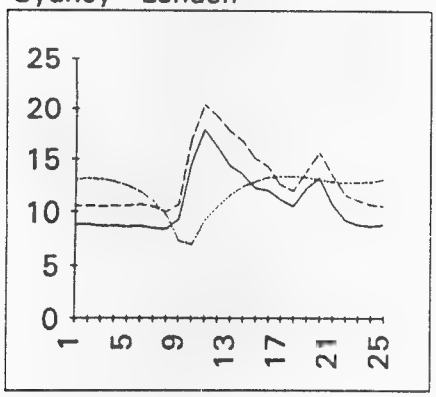

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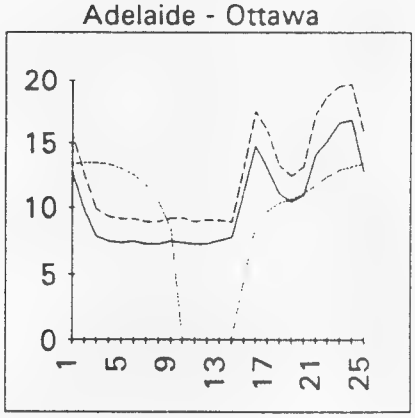
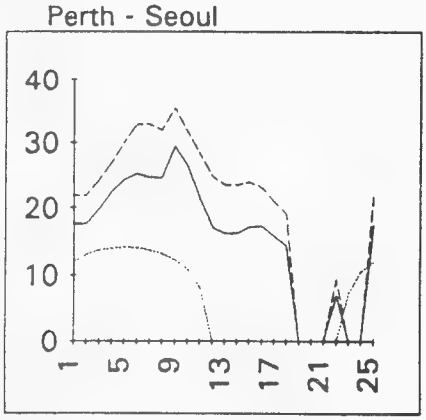


Perth - Seoul



HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● HAM LOG v.3.1 — Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its fifth year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special five hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

● PACKET HARDWARE — PACCOM TNCs, Tiny 2 Mark II ($290) and TNC320 dual port ($375), CASSPAK 1200 low-cost modems, fully built and tested ($85) runs with TPK, BayCom, etc, BAYMOD 9600 baud modem ($200). All prices for hardware include P & P. REGISTERED SOFTWARE — paKet 6.1 TNC terminal program ($30), with manual ($55) includes P & P. BAYCOM 1.6, a TNC emulation program with manual ($35) includes P & P. SHAREWARE — TPK 1.82, Superpacket 6.10, PKTWin 2.1, JNOS 1.10L, TNOS 2.01, WINPACK 4.0, FBB 5.15 & BPQ 4.08, NOSview 304, Compress Utilities 3, F-PROT 2.18a and other shareware titles available for $5 each plus $2 P & P. BAYCOM USCC4 (Universal Synchronous Communications Controller) internal PC plug-in communications card with up to four packet modems. Basic card with no modems installed $250. 1200 baud TCM 3105 modem $105, 3001/1200 baud 7911 modem $150, 9600 baud DF91C modem (G3RUH compatible) $205. Card with these three modems installed $630. Requires BayCom 1.6 or BPQ 4.08 as driver. Send SASE for complete price list or membership details to AAPRA, VK2IN @ VK2DAA or QTHR or (02) 489 4393.

FOR SALE NSW

● SULLIVAN precision oscillator 0-12 kHz used 1930s to calibrate xtals, rack mtd, spare valves. Three home brew generators, dot and cross hatch, TV sweep, R/C bridge. $ zero. Thorn Industrial Vidicon camera, lens f1.9, 25 mm, 3 spare vidicons, $50. Arthur VK2IK QTHR (02) 876 1465.

● RACAL COMMS Rx eqpt, RA17L 0.5 to 30 MHz, ISB adaptor, original bench cases, handbooks, exc cond, $600 ono. Brian VK2GCE QTHR (02) 545 2650.

● YAESU FT707 HF mobile transceiver with CW filter, $650; YAESU FP707 power supply, $350; WERNER Wulf 6 el 6 m beam, $80; ATN 11 el 2 m beam, $50; ATN 14 el 70 cm beam, $60; KLM 6 el 70 cm x 2, $20; KR400 Azimuth Rotator, $300; CHIRNSIDE 2 m Ringo Ranger, $50; DICK Smith 2 m base vertical, $30; MARCONI 10-300 MHz calibrated signal generator (circa 1953), $200. Steve VK2ZSC QTHR (02) 626 7667 after 6.30 pm EDST.

● STANDARD nicad battery pack CNB161 700 mAh for Standard C168 (2 m) and C468 (70 cm) handheld transceivers, good condition, $60; SCANNER PRO 2022 210 channel desktop, mobile, mains + 12 V, in original packing, as new, cost $550, sell $300. Brad VK2KQH day (02) 9906 5855, otherwise (018) 640 377.

FOR SALE VIC

● KENWOOD TM-241A, 50 W, 2 m FM transceiver, as new, little used, $495 ono; ICOM IC-28A 2 m transceiver, 25 W, ec, $375 ono; both rigs complete with manuals, mobile mounts, mics and cables. Bill VK3BR, QTHR, 9584, 9512.

● KENWOOD TS850S s/n 31200069 with in-built ATU, one year old, in vgc, $3300; KENWOOD PS52 s/n 30800304 power supply, one year old, in vgc, $437. Jim VK3NR (03) 9367 6920.

● ICOM 735 with CW filter, $980; KENWOOD TS680S with DSE 100 W 50 MHz linear, $1250. Ray VK3LK (055) 29 2267.

● DECEASED ESTATE Ex VK3PZ. Very well constructed 40 metre mobile whip antenna, $15. Ivor VK3XB QTHR (03) 9795 6229.

● ANDREWS 6' diameter spun aluminium dishes, very shallow dishes, can arrange delivery depending on location, $250; PHILIPS FM92 E band converted to 70 cm, 99 channels converted, $300 each, remote control version, at least 25 watt output; AWA RT85 UHF remote control radios, 64 channels, converted to 70 cm 25 watt output minimum, $250; KENWOOD TM2570 144-148 MHz transceiver, 60 watts output, mounting cradle, handbook, $350; YAESU FT77 HF radio complete with FP700 20 amp power supply, FC700 antenna tuner, all in good condition complete with manuals, tranceiver has new WARC bands, 100 watt output, $800 the lot, will not separate; ICOM desktop battery charger, h/h stolen so no need, $80. Graeme VK3MIL (053) 36 1520 or (03) 752 3500.

FOR SALE QLD

● KENWOOD TS830S HF transceiver s/n 2031326, $800; KENWOOD TS130S HF transceiver s/n 1040723, $600; KENWOOD MC50 desk microphone, $50; REALISTIC HTX100 10 m transceiver s/n 95000428, $250; VICOM noise cancelling microphone, $20. Barri VK4JBJ QTHR (07) 3209 3372.

● ICOM IC-720A txcvr includes general coverage Rx, purchased Daycom 1995, includes manual, $700 or swap Tentec Century 21 CW txcvr and cash difference; SWAN 350 txcvr, vgc with vox and manual, $240. "Doc" VK4CMY (076) 85 2167 AH.

● VALVES for amateurs and restorers, octals, novals, ceramic sockets, 6146, 807, 6V6, rectifiers, regulators, valves for QRP circuits, high watt wirewound resistors, mobile rack MB100 for Kenwood 130S. Send SASE for list. Ted VK4YG QTHR (070) 97 6387.

● SHACK Clearance estate, 97 Jubilee Terrace, Bardon Sundays 9-5. Generator 120 V 1500 W, pump, spot welder, PSUs, transformers 285-1500 V, DC/AC meters, Tx caps, resistors 5 W, caps ceramic poly electro, books, manuals, no valves. Peter VK4APD (07) 3397 3751 AH.

● YAESU FT757GXII HF xcvr s/n IL590069, as new in ctn, PC $1250. Peter VK4EFX (074) 95 8724.

● ICOM 735 transceiver recently serviced by ICOM, $875. Ted VK4DBL (074) 91 2034.

FOR SALE SA

● SHACK CLEARANCE. Antennas, new and used radio equipment, RF adaptors, RFDS antenna base with spring, much more. All must be sold. Send SASE to PO Box 76, Peterborough SA 5422 or ring for list. Paul VK5MAP (086) 51 2398.

● YAESU FL-110 100 W HF linear amp s/n 060256, suits FT-7, TS120V, etc, $200. Jeff VK5BJF QTHR (08) 8842 2085.

● KENWOOD TR2400 2 m FM transceiver, Kenwood ST-1 base/stand/mains charger. Shure 404C HH-Mic to suit above, instruction manuals/sheets for all above, $300 ono. Jim VK5JI QTHR (08) 295 8094.

FOR SALE WA

● UNIDEN HR10 mobile 10 meter tcvr, 25 W, all mode, digital, VFO/RIT, s/n 05000155, unused and in original packing w/handbook, accessories, include up/down mike, $400 plus P & P. "Beau" VK6COP QTHR (09) 457 8179.

WANTED NSW

● MORSE keys, especially Mecograph or the McDonald Pendograph or any unusual Australian keys or Jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6 pm.

WANTED VIC

● YAGI beam 15 m/ 10 m, rotor and tower also of interest. Must be light weight. Bendigo area. Bob VK3MRG (054) 39 6314.

● STC 191 UHF carphone. Ian VK3AQU QTHR (057) 51 1631 AH or (057) 52 2713 BH.

WANTED QLD

● TENTEC Century 21 CW txcvr, Heathkit Tx, Rx, txcvr or amplifier for collection, US made HF gear from 1960-70 era for collection. "Doc" VK4CMY Granite Belt Amateur Wireless Group (076) 85 2167.

WANTED WA

● Txcvr FT7, plug in cards, cont unit PB1622, RF marker unit PB1633, and for txcvr FT7B, RFPA 50 W PB1879. John VK6RJ QTHR (091) 92 1161.

MISCELLANEOUS

● THE WIA QSL Collection requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

ar

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5001
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

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Fill out the following form and send to:

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Mr, Mrs, Miss, Ms:.....

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Call Sign (if applicable):.....

Address:.....

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VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WSS Tuesday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 2030 local on 3550 kHz

VK5RCW Continuous on 144.975 MHz, 5 wpm to 12 wpm

VK6RCW Continuous on 147.375 MHz, 4 wpm to 11 wpm

VK6WIA Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz.

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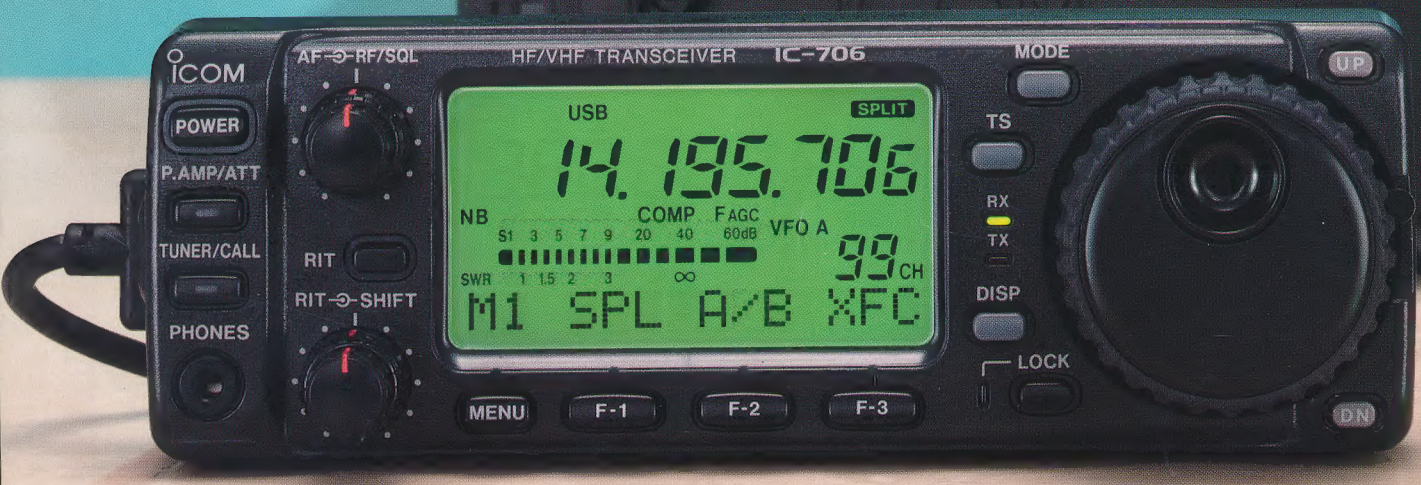

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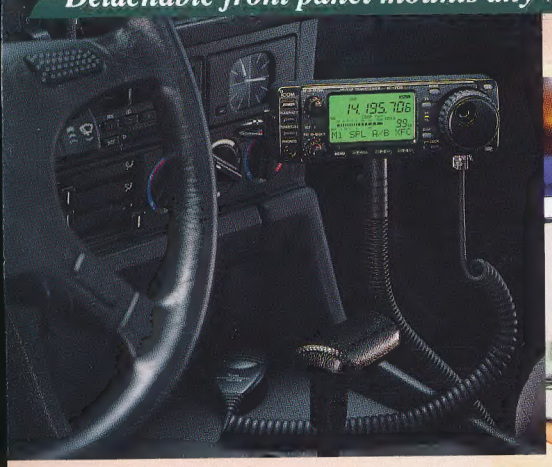

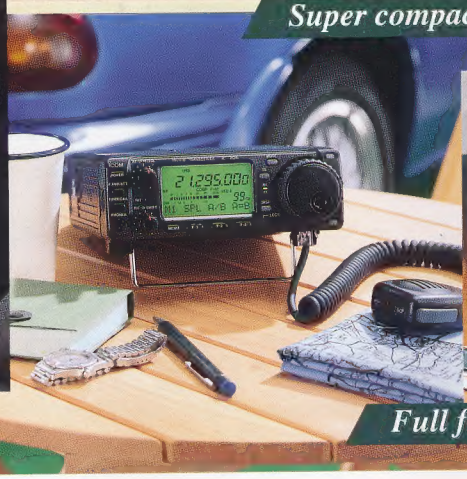

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